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methyl salicylate ointment, etc. Our correspondent wonders if an injection of horse serum would be of benefit in increasing the coagulability of the blood.

Income Tax.

Schedule E: Expenses.

"C. R. G." has claimed to deduct from his salary expenses incurred for medical periodicals and upkeep of medical library. The inspector of taxes has refused the claim, referring him to the decision of Rowlatt, J., in the case of Simpson *v.* Tate.

*** The refusal is in accordance with the law, as judicially laid down; "C. R. G." has no prospect of appealing successfully unless he can show that the purchase of the medical literature (or membership of the societies distributing it to him) was a condition of his appointment to the office he holds.

Cash Basis.

"R. M. W." is being pressed by the inspector of taxes to render his firm's returns on the basis of actual bookings; past returns have been prepared by chartered accountants on the basis of actual receipts.

*** It is officially agreed, we believe, that the basis of actual bookings is incorrect and also unfair to the practitioner unless it is modified by the deduction—authorized by law—of a carefully made estimate of anticipated loss by reason of bad debts. That estimate it is almost impossible to prepare in such circumstances as "R. M. W.'s," except on the basis that the percentage lost in the past is likely to be the ratio of loss in the future. If the amount of debts outstanding does not differ materially from one year to another, the result of taking such an estimate will be the same as of preparing the returns on a cash basis. This is the reason why it is a well recognized custom on the part of inspectors of taxes to accept the cash basis in the case of medical practices. If our correspondent's gross bookings have been increasing, then the "cash" returns are lagging behind the true earnings of the practice, and he has no answer (theoretically, at least) to the inspector's contention, but if bookings are not increasing, we think that an application to the Board of Inland Revenue, Somerset House, would probably receive sympathetic consideration.

"P., T., and R."—A, B, and C were in partnership until June 30th, 1926, when A left the firm, undertaking not to act as a general practitioner, but carried on as a surgeon and consultant. How should the assessment for 1926–27 be dealt with, and can A and/or B and C claim "specific cause"?

*** The old ratio of division will, of course, apply for the first quarter of 1926–27. For the remaining three quarters the average should be reconstructed, separating A's specialized work from the general practice now carried on by B and C and dividing the remainder of the assessment accordingly. The question of "specific cause" is, in the circumstances, somewhat intricate, and, as it is at present a hypothetical one, we suggest that it be referred again when the result of the next accounts—that is, for nine months to March 31st, 1927—is available.

Estate Duty.

"M.D."—Dr. X. died in 1918, leaving a small estate. His will provided *inter alia* for payment of an annuity of £80 to a dependant. The annuitant has now died, and the Inland Revenue claim payment of a further estate duty upon the sum which had been invested to provide for payment of the annuity.

*** The facts appear to be within the rule laid down in Attorney-General *v.* Watson and others [1917], 2 K.B., 427, in which it was held that the cesser of an annuity gives rise to a claim for duty. In dealing with the statutory provisions (Finance Act, 1894, Sec. 2 (1) (*b*), Lush, J., said: "The object of the section is to make estate duty payable whenever there has been a succession, in fact, or that which is equivalent to a succession—whenever there has been a cesser of an annuity by reason of the death of the annuitant, which cesser causes a benefit to accrue to that property."

LETTERS, NOTES, ETC.

Cholecystography.

Mr. G. P. B. Huddy, M.S., F.R.C.S. (Dudley Road Hospital, Birmingham), writes: The fatality following the injection of sodium tetraiodophenolphthalein, referred to in your issue of September 18th (p. 542) and again on October 2nd (p. 620), occurred in a patient under my care and was brought to the notice of the medical profession in the *Lancet* of September 4th (p. 509).

The patient was a woman, aged 46, and her weight was 11 st. 1½ lb. The dose given was 5½ grams in 40 c.cm. of triple distilled water, this being the maximum dose used by Professor D. P. D. Wilkie (British Medical Journal, 1925, ii, p. 1046). I gave the injection myself, and it was carried out very slowly, during a period of over twenty minutes. During the injection the patient complained of abdominal pain, which was followed by vomiting and headache. Immediately after the completion of the injection the pain became so severe that she rolled about and screamed. The body became rigid, there was frothing at the mouth, and then loss of consciousness. The pulse and respiration became more and more feeble, the pupils dilated, and death ensued in spite of all efforts at resuscitation.

The makers of the preparation were immediately informed and samples were tested, but no alteration in the compound could be detected. I should like to point out that, contrary to my previous practice, the solution had been made up the day before use. Another patient injected immediately preceding and under similar circumstances had a more severe reaction than is usual.

The amount of drug used by different workers has varied, and, in view of the above experience, I feel that some patients are particularly susceptible, and that the amount given in this case is too high for general use. This would seem to be confirmed by Mr. Stanford Cade, who, using a smaller maximum dose of 4½ grams, observed in two consecutive cases a very similar train of symptoms to that described above. In describing the cases he states ". . . the pulse at the wrist could not be felt for half to three-quarters of an hour" (*Lancet*, July 3rd, p. 5). The injection of the solution in two portions, with a short interval between, is a safeguard, for the symptoms develop rapidly, and by adopting this procedure the second portion could be omitted if advisable.

The value of intravenous injection of sodium tetraiodophenolphthalein is to be estimated by the increased percentage of correct diagnoses so obtained over that obtained by ordinary clinical and other means of investigation, including oral administration of the drug.

An Acid Dentifrice.

Dr. W. J. Henson (London, W.) writes: Six years ago (Journal, 1921, vol. i, p. 408) you published a letter from me under the above heading. I have had before me correspondence from doctors and dentists in all parts of the world, and up to the present not one has controverted my assertion that chalk and soap, forming the basis of the major part of the tooth pastes in modern use, depress the flow of alkaline saliva, which is Nature's preventive of pyorrhoea and dental decay. On the occasion to which I refer I gave the ingredients of a fruit acid tooth paste formula which I had used in my practice for a number of years, and now, after this lapse of time, I am in a position to confirm my former statement that I have never seen a recurrence of pyorrhoea or decay in any case in which it has been properly used.

Plumbo-solvent Waters.

"Hydraulic Engineer" writes: The method advocated by Dr. T. D. Harries (October 23rd, p. 764) for safeguarding the public against dangers incurred by the use of lead pipes for the conveyance of soft water is as effective as it is simple, and can be applied with equal advantage to the water supplies of towns, villages, schools, and country houses. It is now for the authorities to broadcast the information given by Dr. Harries, which can justly be proclaimed as a most valuable contribution in the cause of public health.

Garlic in Pneumonia.

Dr. C. J. Hill Aitken (Kilnhurst, Yorks), writing with reference to a Memorandum by Dr. F. W. Crossman (Journal, 1924, vol. i, p. 519), in which it was stated that the use in pneumonia of a spirituous tincture of the garlic bulb brought about a rapid cure, relates that in two cases under his care in which it was proposed to employ this remedy the crisis occurred on the fifth and sixth days of the illness respectively, and before the drug was obtained. In another case the crisis came after a dose of castor oil, and in yet another after a change in the medicine. Subsequently to reading the article on garlic, he noticed a statement made at a medical meeting that pneumonia had changed its type and was tending to abort much sooner than the eighth day. In twelve months he had a series of thirty-six cases of pneumonia in which the treatment was on ordinary lines, without one death. He thinks that this result justifies the continuance of the treatment of pneumonia in the usual way, and that the good results ascribed to garlic may be of the nature of *post hoc ergo propter hoc*.

Corrigenda.

The writer of the review of the current issue of *Brain* in last week's Journal (p. 793) calls attention to a sentence in which the insertion of the word "and" changed its meaning. The sentence commences in the ninth line of the second paragraph of the review, and should read as follows: "It is found that when the drum is rotated in a clockwise direction viewed from above, nystagmus develops in an individual watching the drum," etc.

In the report of the discussion on "Surgery and the Workmen's Compensation Act" at the Royal Society of Medicine (Journal, October 30th, p. 788), by a reporter's slip the few remarks stated to have been made by Mr. Maynard Smith should have been attributed to Mr. Maynard Heath. Our sincere apologies are due to both gentlemen.

Vacancies.

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 47, 48, 49, 52, and 53 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 50 and 51.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 207.

THE CANCER PROBLEM.

A Summary of the Lloyd Roberts Memorial Lecture.*

BY

W. E. GYE, M.D.,

PATHOLOGIST, MEDICAL RESEARCH COUNCIL'S FARM LABORATORIES, MILL HILL.

I desire to express my thanks for the honour of being asked to deliver this, the fourth of the lectures established to perpetuate the memory of Lloyd Roberts. The subject which I have chosen for the lecture is not entirely within the special field of medicine in which Lloyd Roberts was an acknowledged master, but my hope is that what I have to say will be of sufficient interest to make the lecture worthy of the occasion.

I shall begin by indicating at once my general viewpoint on the subject of cancer, and I cannot do better than quote a few words from the introductory note of the first scientific report of the Imperial Cancer Research Fund (1904):

"The combined histological and clinical observations of the last fifty years have established the malignant new growths as a natural group related to each other by fundamental common attributes. The explanation of those common fundamental characters is bound up with the mode of origin of malignant new growths, and is the problem awaiting solution, to be followed by the specific explanation of individual variations as its natural corollary."

I do not know how far this would meet with general approval. There are some very distinguished pathologists who take the view that there is no common cause of the fundamental characters of new growths; to such the search for a cause of the disease is an irrational pursuit. This view I regard as simply obscurantist, and so, perforce, I leave it to time and the progress of knowledge to decide the issue.

My task is to tell briefly the essential story of the attempts which have been made to solve the problem set out in the quotation above. Naturally I shall advocate my own views of the solution of the problem, but I am more anxious to show—and if I fail the fault lies with me and not with the facts—that at least the problem has been defined and brought to a practical stage by the immense efforts of experimental pathologists during the last twenty-five years.

The earliest record of cancer experiments goes back to 1775, when Peyrilhe attempted to transfer a human breast cancer to a dog. The experiment was a failure. It has been repeated, with variations, over and over again by numerous observers—by Dupuytren, by Langenbeck (1840), Lebert and Follin, Duplay and Cazin, etc.—and invariably without success. Roux and Metchnikoff, and also Jobling, have attempted to transfer human tumours to anthropoid apes, and failed. All this early work has shown the impossibility of transferring human tumours to the lower animals.

In 1889 Hanau described the first successful transplantation of a carcinoma within the same species. The tumour was of a rat, and in structure was a squamous-cell carcinoma. It was transplanted into two other rats and formed small nodules in both. Pfeiffer (1890) was successful in transferring a melanotic carcinoma of a mouse to other mice. Von Eiselsberg (1890) successfully transplanted a spindle-cell sarcoma of a rat to another rat. Morau (1891) was the first, by the method of transplantation, to cultivate a tumour. He was able to maintain a carcinoma of a mouse for seventeen generations over a period of three years by the inoculation of fragments of the tumour into other mice. Firket (1882) and Velich (1898) were successful in transplanting a spindle-cell sarcoma and a subperiosteal sarcoma of the rat respectively.

These observations attracted but little attention, and it was not until Jensen, Loeb, and Borrel had turned their attention to them that the significance of such work began to be appreciated. The present era of experimental cancer research may be said to date from the publication of Jensen's paper in 1902. His work, which was carried out with a carcinoma of a mouse, confirmed the observations of the previous experimenters already mentioned, in showing that a malignant tumour can be transmitted indefinitely within the species in which the tumour arises. Further, Jensen was unable to find micro-organisms in the transplanted tumours, and described experiments in which was tested the resistance of the cancer cell to different agents. During the same period Loeb studied a cystic sarcoma of the thyroid of the rat and obtained results essentially similar to those obtained by Jensen. Borrel, working with a mouse carcinoma, added further confirmation.

It will have been observed that the animals used by the experimenters mentioned were rats and mice, and the question now arose as to the occurrence of true new growths in other species. In the first scientific report of the Imperial Cancer Research Fund a list is given of the animal tumours examined in the laboratories of the Fund during the year 1903. Tumours of the most varied histological kinds, sarcomata and carcinomata, of the following animals are mentioned: cow, dog, horse, sheep, pig, mouse, cat, hen, Indian parakeet, giant salamander, cod, gurnard, and trout. Since that time observations of pathologists throughout the world have established definitely the fact that new growths occur commonly in all the lower animals, both domesticated and wild. Cancer is not, therefore, a purely human disease, and any explanation of cancer in man must also explain the phenomena presented by cancer in the lower animals. These observations are uncontested and are of fundamental importance; they rule out of account the all too frequent pronouncements that cancer is a disease of civilization and can be abolished by a return to a "natural" mode of living—whatever that may mean.

In the literature of twenty years ago may be found papers in which doubt was thrown on the neoplastic nature of animal tumours, but the question has now been most thoroughly studied, and the opinion among those most competent to judge is that the animal tumours are true new growths. It is therefore no longer necessary to discuss the point at any length. It is sufficient to say that in mode of origin, in age incidence, in clinical course, in mode of growth and infiltrative spread, and in the formation of metastases, there are no differences between tumours of man and of animals. The same range of tumours, benign and malignant, is met with in animals, and it is with this material that the greater part of experimental studies have been carried on.

The method by which a tumour is transferred from one animal to another consists in the implantation, usually subcutaneously, of a fragment of the tumour by means of a trocar or a syringe. From the implanted fragment a new tumour arises. Is the new tumour produced by infecting the cells of the host, or does it arise by multiplication of the cells implanted? This question was studied by Jensen by the following technique. A series of animals—mice—was inoculated, in the manner indicated, with a mouse carcinoma, and at regular intervals one of the inoculated mice was killed, the whole of the graft and surrounding tissues fixed and cut in serial sections. In this way the fate of the implanted cells could be followed. Jensen showed decisively for a carcinoma—and his results have been confirmed by numerous observers—that the daughter tumour is derived entirely from the cells of the implanted graft. The central portion of the graft dies, but the peripheral cells live; the fate of the implanted stroma of the graft is difficult to follow, but a new stroma is provided by the host, and it is this which nourishes the rim of neoplastic cells of the implanted fragment. The process, then, is a true transplantation and not an infection. Loeb, who studied the same problem with a rat sarcoma, was unable to come to a decided opinion. He inclined to the belief that the new tumour was derived partly from the malignant cells inoculated and partly, by a process of infection, from the connective tissues of the host. This difference in finding, however, may be merely one of technique and depending upon the difficulty of recognizing a malignant from a normal connective tissue cell. Wherever the cells of the implanted tumour are easily distinguished from the cells of the area in which the fragment is placed, the question at issue may be determined by early-stage examinations. The general result of an immense amount of investigation of this character has been to show that the inoculations of tumours are true

* Delivered at the Royal Infirmary, Manchester, November 9th, 1926.

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to indicate the extremes to which men will go to explain away a fact which runs counter to a strongly held opinion.

Rous and his collaborators in their long researches into the filterable tumours came to the opinion that the balance of evidence was in favour of the agent being a living, filterable micro-organism. Now what is the evidence that such things exist at all? If we take the classical example, and the first discovered, of an animal disease believed to be caused by a filterable virus we shall consider foot-and-mouth disease.

The current belief that foot-and-mouth disease is caused by a filterable virus is founded upon the following evidence. When the vesicular fluid of a lesion in this disease is diluted and filtered through a good candle, and the filtrate is injected into a normal animal, this animal acquires the typical signs and symptoms of the disease. The vesicular fluid obtained from the second case may again be diluted and filtered, and once again the filtrate will reproduce foot-and-mouth disease; and so on *ad infinitum*. The filtrate when examined by ordinary microscopic and cultural methods is sterile, but since the causal agent reproduces itself indefinitely in the bodies of the inoculated animals it must be a living thing, and it is, as we have seen, of ultra-microscopic size. Upon this evidence almost all bacteriologists believe that the cause of foot-and-mouth disease is an ultra-microscopic microbe. The evidence produced by Peyton Rous with regard to the filterable tumours was of the same kind and quality, and is now more extensive. But opinion against a microbic cause of tumours is strong, and few are prepared to accept for tumours conclusions which, on similar evidence, are unquestioned in other fields of medicine.

Let me now state the problem which is before all of us. Thousands of tumours of men and animals have been studied. Large numbers have been cultivated by transplantations. A considerable number of tumours have been induced *de novo* by means of chemical and other irritants, and have been carefully studied. Almost all attempts to find an extrinsic cause—or a cause separable from the cells—have failed. But for about half a dozen tumours, of various histological kinds, a cause, a filterable virus, separable from cells, has been found. How shall we look upon this astonishing difference? We may regard the filterable tumours as a disease *sui generis* unrelated to other tumours; in this way we must suppose that a filterable virus plays a part in the causation of certain tumours which is comparable to the part played by tar or soot in others. This attitude to the problem has been general, but I think that it is a mere evasion of a very real difficulty. The problem exposed by the work of Rous does not consist solely in the isolation and cultivation of a virus. The true explanation of these tumours must, in the first place, decide whether or not a virus is present; and in the second place, equally important from the point of view of the cancer problem, must give us some understanding of the extraordinary specific character of active filtrates.

For my part I agree most emphatically with Rous, Murphy, and Tytler that "the findings with the chicken tumours largely demolish the theoretical basis on which objections to an extrinsic cause for cancer have been built up." But can these positive findings of Rous be reconciled with the negative results of similar experiments made with the majority of other tumours? I think they can.

The Filterability of the Rous Tumour.

It has already been pointed out that the exceptional character of the tumour lies in the fact that cell-free extracts are able to cause the formation of a new tumour. This property of the tumour must therefore be carefully studied, and we must know how far it is a fixed and constant property. It has generally been looked upon as constant, and the tumour has on this account been set in sharp contrast with mammalian tumours. This is not in accordance with the facts; they are not quite so simple. Peyton Rous remarked in one of his papers dealing with the filterability of his tumour that sometimes, and under the best conditions, cell-free filtrates are unaccountably innocuous. That, I am sure, has been the experience of all investigators who have worked for any length of time with the tumour. In my experience it has been unusual, for example, to obtain a potent filtrate from a tumour which has been induced by the inoculation of dried tumour tissue, or from a tumour which has been caused by the inoculation of filtrates damaged by heat. But when failure to obtain potent filtrates is an irregular thing the most obvious explanation is that the failure is caused by some technical difficulty. Filtration is not a simple regular process, and it is easy to understand irregular qualities of filtrates. But it has now been shown that technical difficulties cannot fully explain such failures. Dr. Andrews and myself have described how a Rous tumour lost its property of filterability, and how this property remained absent for more than five months and then suddenly reappeared. During this long period the tumour was transplantable only by means of living cells—that is, it behaved like the recognized tumours of mammals. Clearly, then, this property of filterability is not fixed; all we can say is that generally a filtrate of the tumour is active—sometimes feebly, sometimes intensely; often it is quite inert. And since it has generally been accepted that a potent cell-free filtrate contains the tumour's cause, are we, then, to say that sometimes the cause is present in the filtrates and sometimes it is not? The solution of this apparently ridiculous dilemma will be shown later; at present I merely wish to point out that sometimes the tumour's cause gives no sign of its presence.

The Effect of Heat on Filtrates.

It was shown by Rous and Murphy that tumour extracts are always robbed of their activity by exposure to a temperature of 55° C. for fifteen minutes. This statement I can confirm completely. It has been tested very carefully, and the method employed is as follows: Not more than 3 c.cm. of the tumour extract is sealed up in a thin-walled, hard-glass test tube, which is then attached to the bulb of a standard thermometer and completely immersed in a water-bath kept at 55° C. The thermometer and attached tube are shaken gently during the period of heating. Tested in this way, tumour extracts, whatever their initial potency, are invariably inactivated. Rous and Murphy regarded this result as evidence that the causative agent of the tumour had been destroyed; and of course it looks very like it. Whatever the agent is that is destroyed in such a short time at 55° C. it is evidently very sensitive to heat, and judging by the thermal death points of other viruses, it is not likely to be a virus. This view is supported by a study of the effect of lower temperatures than 55° C. upon a series of filtrates of tumours. A filtrate, usually through a Mandler candle, was made from all the routine tumours obtained during a period of more than six months—in all more than forty tumours. Each filtrate was tested at temperatures from 45° to 55° C., variations being made from time to time. During the period chosen the tumour was not very malignant, and as malignancy and activity of filtrates run parallel with one another, the filtrates were not very potent. In a few tests made, it was found that 0.5 c.cm. of Mandler filtrate was barely sufficient to induce a new tumour; 2 c.cm. was in each case adequate. All the samples of such filtrates were inactivated by exposure to 55° C. for fifteen minutes; often 50° C., and sometimes 45° C., for fifteen minutes was sufficient. When suddenly the tumour became exceedingly malignant, metastasizing freely in liver, lungs, spleen, and elsewhere, and the filtrate became exceedingly active, inducing tumours in doses of 0.001 c.cm., then it was found that 54° C. for fifteen minutes was insufficient to destroy all activity—the activity of the filtrate being merely reduced—but that exposure to 55° C. for fifteen minutes was effective.

It is evident from this experience that the substance in the filtrate which is sensitive to heat is variable in amount or in quality in filtrates from different tumours.

Effects of Antiseptics upon Tumour Extracts.

One of the reasons given by Rous and Murphy for their belief that the filterable agent may be a virus was that antiseptics destroy the agent. It is only fair to state that Dr. Murphy has since changed his mind; he now thinks that it is unnecessary to assume a virus. His opinion of 1912 seems to me to be sounder than his opinion of 1926. Carbolic acid, corrosive sublimate, toluene, chloroform and

transplantations, that the daughter tumours are derived from the cells of the original new growths, and that the inoculated animals merely act as a medium in which the cells proliferate. By losing sight of these fundamental facts and by regarding transplanted tumours as *new* growths cancer research has often been led into blind alleys.

The failure of the earliest investigators of cancer to transfer the human disease to lower animals has been mentioned already. This failure probably played a large part in forming the opinion that cancer is essentially a human disease. But it was quickly shown by experimental research that the tumours of animals are transplantable only within the species in which they occur. Thus a dog tumour cannot be propagated in a cat, or a cat tumour in a dog. In the light of the discoveries of experimental histologists this is easily understood. It has been shown that inoculations of tumours are transplantations, and therefore it could not be expected that the cells of a dog, for example, would grow indefinitely in cats or any other species of animal than the dog. The cell of an animal carries the species specificity. Certain observations have been made which would appear to invalidate this conclusion. Murphy discovered that mammalian tumours can be grown in a developing chick embryo. This discovery has been confirmed by many observers, including myself. From a minute fragment of a mouse carcinoma a considerable amount of growth can be procured, and the astonishing picture is obtained of mouse epithelial tissue growing rapidly around a stroma provided by the chick embryo, new blood vessels in which course nucleated red cells penetrating the mass of growth.

The same phenomenon of heteroplastic growth can be obtained in mammals by inoculating a mouse sarcoma into new-born rats. The cells proliferate and form a large tumour, which can again be transplanted into new-born rats. In this way it is possible to maintain a mouse sarcoma for several generations in rats. But such work has no real bearing on the cancer problem. The implanted cells *remain mouse cells*, and the maintenance of the tumour for a few weeks or months in a series of new-born rats is merely a laboratory trick which leaves the main problem unaffected.

Since daughter tumours are derived from the implanted tumour cells it follows that living cells must be inoculated in order to obtain a second tumour. With epithelial tissues this is obvious indeed; inoculations are usually made subcutaneously into the connective tissues, and the formation of an epithelial daughter tumour could not be expected to occur from infection of connective tissue cells. It is, however, an experimental fact that when the cells of a tumour are killed, whether by heat or by drying, by means of antiseptics or by mechanical disintegration, the mass of dead material no longer possesses the power of giving rise to a tumour when it is inoculated into a suitable animal. Thus, coincident with the death of the tumour cell, there disappears the power of inducing a daughter tumour. The fact fits exactly with the logical deductions from the histological analysis of the changes accompanying the processes of transplantation.

Such beautiful interlocking of fact and deduction served to strengthen the already strong conviction that the tumour cell is itself, as it were, the parasite. Nothing, apparently, is separable from the malignant cell which can induce the formation of a new tumour, and the general opinion has been reached, and is now held almost as a dogma, that the malignant cell is one which, under the influence of many possible inciting causes, has assumed a character or quality which enables it to grow and divide steadily and persistently beyond the needs of the rest of the body. According to this view the cell itself is a parasite. The position is most clearly indicated by the following facts. It is now possible by following the brilliant work of Yamagiwa and Ishikawa to induce tumours in rats and mice by repeated applications of tar to the skin or subcutaneous tissues. The tumours thus produced are typical new growths and behave in every respect like spontaneous tumours which are caused in some way which we do not yet understand. A tar tumour of a mouse—carcinoma or sarcoma—can be transferred by transplantation to other mice, but living cells are necessary for success. It cannot be successfully transplanted to a rat or to any other species of animal. It is as much an individual mouse tissue as a mouse is an individual mouse. In the same way a rat tar-tumour can be transplanted successfully only to other rats, and only by the inoculation of living cells. We thus arrive at the interesting position that one and the same irritant acting upon two species of animals will induce new growths in each species, but the new growth in each case is individual and particular to its own species. Clearly the extrinsic agent, the tar, has induced an intrinsic change in the cell. It is thus easy to understand why a microbic hypothesis of the origin of tumours is met with scepticism and indeed contempt. It would be strange were it otherwise. Nevertheless, I believe that these apparently conclusive facts merely conceal the truth.

And now I come to the exceptions in all this mass of tumours. I refer to the well known fowl tumours described by Peyton Rous. For the purpose of simplification I shall describe and discuss only one of these tumours, the first to be discovered, and the one which is in the hands of pathologists all over the world. It is a spindle-cell sarcoma, of primitive type, which occurred spontaneously in a Plymouth Rock variety of the domestic fowl. The tumour was first described in 1910, when it was shown to be transplantable in the usual way, but to exhibit an unusual degree of specificity for the variety of bird in which it originated. Indeed, the early transplantations were successful only in blood relations of the fowl which bore the spontaneous tumour. Now, after many years of artificial transplantation, the tumour grows in almost any variety of fowl, but, like mammalian tumours, it retains its species specificity strictly—that is to say, it will not grow in pigeons, ducks, or any other species of bird, or in any mammal. Now this tumour was found by Peyton Rous to differ from all other tumours examined up to that time in being transferable to fowls, not only by means of living cells but also by means of dried tumour tissue or by means of cell-free filtrates. The cell-free filtrates, therefore, contain the tumour's "cause." And, most surprising fact of all, the filtrate is infective only for fowls, and causes the reproduction invariably of exactly the same kind of tumour—a spindle-cell sarcoma. Thus the agent derived from the tumour cells has the power of exciting the formation again of a new tumour by transforming the normal connective tissue cell of the fowl into malignant cells, and this power is exerted only in one species. It is easy to believe in the specificity of animal cells, but here apparently the specificity is freed from the cells and is obtained in solution—or at least it passes through a filter.

Of such tumours half a dozen or so have been described; but it does not matter much whether the number be half a dozen or half a hundred: the problem to be faced is the same and is challenging to all of us. Before trying to make clear what I conceive to be the problem, I will state and discuss briefly the essential facts upon which there is general agreement.

First, the tumour is a true new growth as judged by the most rigid standards; secondly, filtrates through candles which hold back very small bacteria are able to induce sarcoma formation; and thirdly, some of the properties of the filterable agent are those which we usually associate with living organisms.

The general reaction to the discovery of these tumours was one of surprise that such a tumour should exist, followed by a half-hearted denial of the neoplastic nature of the growth. To-day most pathologists who have studied the tumour agree as to its neoplastic nature. There exists, however, an unwillingness to consider seriously the possibility of the filterable agent being an ultra-microscopic microbe such as we believe exists in certain animal diseases. Some of the more absurd explanations of the peculiarity of this tumour I will simply mention. It has been suggested that the filtrate of the tumour contains an ultra-microscopic cell which, when injected into the muscle of a fowl, enlarges and becomes a normal cell from which the new tumour forms. A modification of this view which has been put forward is that the active filtrate contains a part of the cell from which the normal cell can again regenerate. Such views, I hope, need no reply. They are stated merely

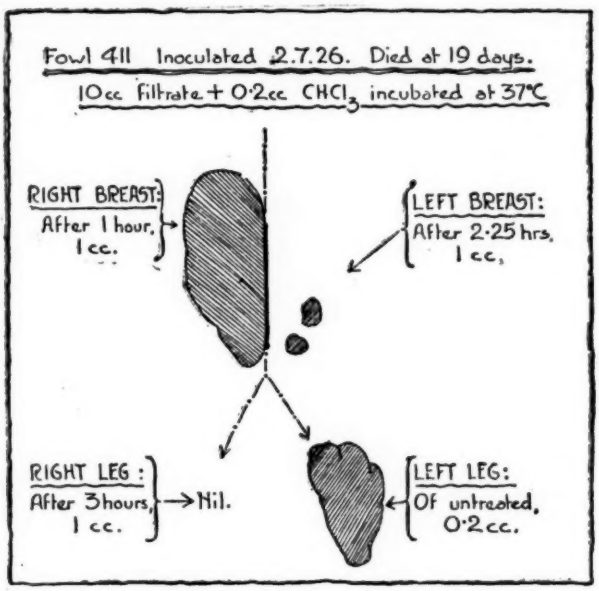
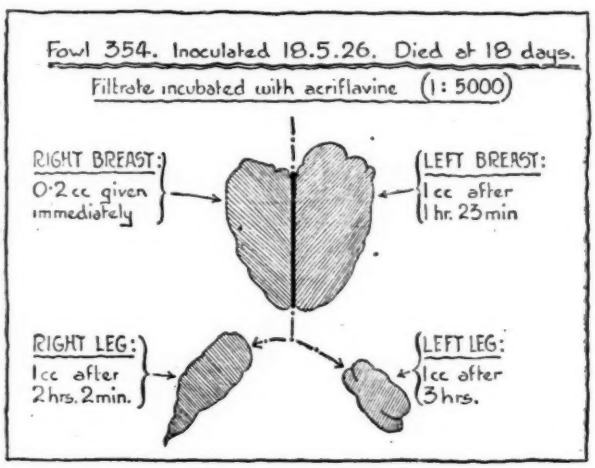

Fowl 411 Inoculated 2.7.26. Died at 19 days.
10cc filtrate + 0·2cc $CHCl_3$ incubated at 37°C
RIGHT BREAST: After 1 hour, 1 cc.
LEFT BREAST: After 2·25 hrs. 1 cc.
RIGHT LEG: After 3 hours, 1 cc. → Nil.
LEFT LEG: Of untreated, 0·2 cc.

CHART 1.


Fowl 354. Inoculated 18.5.26. Died at 18 days.
Filtrate incubated with acriflavine (1:5000)
RIGHT BREAST: 0·2 cc given immediately
LEFT BREAST: 1 cc after 1 hr. 23 min
RIGHT LEG: 1 cc after 2 hrs. 2 min.
LEFT LEG: 1 cc after 3 hrs.

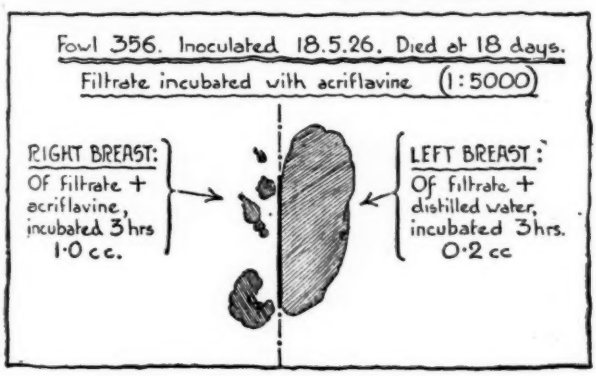

Fowl 356. Inoculated 18.5.26. Died at 18 days.
Filtrate incubated with acriflavine (1:5000)
RIGHT BREAST: Of filtrate + acriflavine, incubated 3 hrs 1·0 cc.
LEFT BREAST: Of filtrate + distilled water, incubated 3 hrs. 0·2 cc

CHART 2

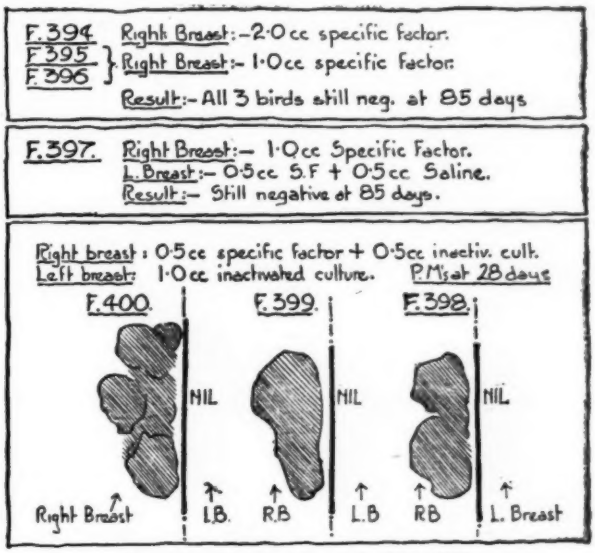

F. 394 Right Breast:-2·0 cc specific factor.
F. 395 F. 396 Right Breast:- 1·0 cc specific factor.
Result:- All 3 birds still neg. at 85 days
F. 397. Right Breast:- 1·0 cc Specific Factor.
L. Breast:- 0·5 cc S.F + 0·5 cc Saline.
Result:- Still negative at 85 days.
Right breast: 0·5 cc specific factor + 0·5 cc inactiv. cult.
Left breast: 1·0 cc inactivated culture. P.M's at 28 days
F. 400. F. 399. F. 398.
NIL NIL NIL
Right Breast L.B. R.B L.B RB L. Breast

CHART 3.—All injections July 27th, 1926.

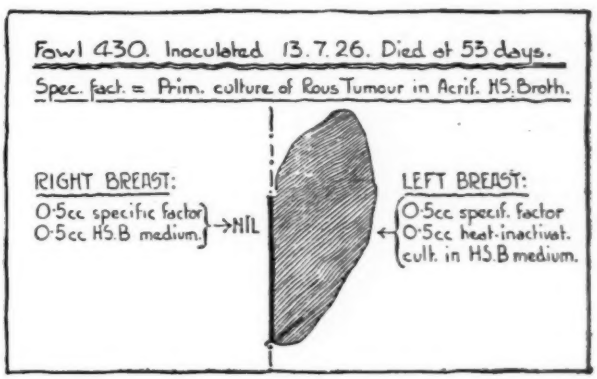

Fowl 430. Inoculated 13.7.26. Died at 53 days.
Spec. fact. = Prim. culture of Rous Tumour in Acrif. HS. Broth.
RIGHT BREAST: 0·5 cc specific factor 0·5 cc HS.B medium. → NIL
LEFT BREAST: 0·5 cc specif. factor 0·5 cc heat-inactivat. cult. in HS.B medium.

CHART 4.

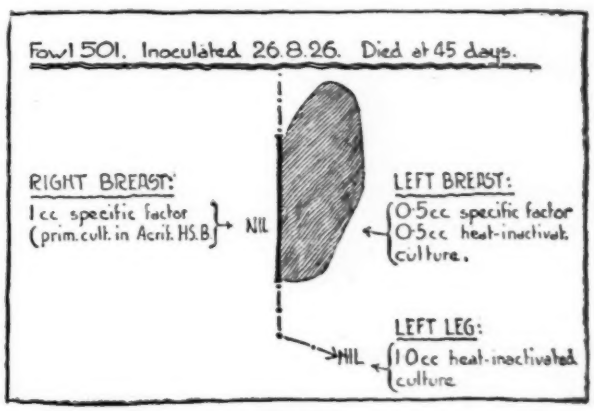

Fowl 501. Inoculated 26.8.26. Died at 45 days.
RIGHT BREAST: 1 cc specific factor (prim. cult. in Acrif. HS.B) → NIL
LEFT BREAST: 0·5 cc specific factor 0·5 cc heat-inactivat. culture.
LEFT LEG: → NIL 1·0 cc heat-inactivated culture

CHART 5.

Chart 7 shows this very clearly. In this experiment the fowl sarcoma filtrate was treated with chloroform, the chloroform removed, and 1 c.cm. of the filtrate was then injected into the right breast of a fowl. Into the left breast of the same animal a mixture of 0.5 c.cm. of this chloroform-inactivated filtrate and 0.5 c.cm. of an extract of a tar tumour of the mouse was injected. A tumour grew in the left breast; the right breast remained quite negative. Chart 8 shows the same result for a human breast carcinoma.

Experiments such as these have been made with a large variety of tumours and with normal tissues. Among the tumours which have provided an agent which can replace that agent of the Rous sarcoma destroyed by antiseptics are carcinomata and sarcomata, both of man and animals. Normal tissues which have been tested are: embryonic tissues (chick, mouse, rat) more than 150 times; adult tissues of animals, including heart, lungs, muscle, brain, liver, and kidneys—and, in one instance, normal human uterus. Not once has it been possible with extracts of such normal tissues to replace the agent destroyed by antiseptic in the fowl sarcoma extract.

My interpretation of such experiments is as follows: In the experiment represented by Chart 8, for example, acriflavine has destroyed in the Rous tumour extract a micro-organism; this interpretation is in accordance with the

ether, hydrogen peroxide, formalin, acriflavine and hydrocyanic acid are some of the antiseptics which have been tested, and they are all effective, each in its own way, in abolishing the activity of tumour extracts. I shall describe briefly the effects of two only of these substances—namely, chloroform and acriflavine.

Chloroform acts very rapidly at incubator temperature. This is shown very clearly in Chart 1, which represents the effect of 0.2 c.cm. of chloroform on 10 c.cm. of clear, cell-free, sand filtrate of a very malignant Rous sarcoma. The mixture of filtrate and chloroform was incubated in a large hard-glass tube in a water-bath at 37° C. After incubation for one hour a sample was removed, the chloroform pumped off, and 1 c.cm. then inoculated intramuscularly into the right breast of Bird 411; after two and a quarter hours a second sample was inoculated in a dose of 1 c.cm. into the left breast of the same bird; and after three hours 1 c.cm. was inoculated into the right leg of the bird. The control in this experiment was provided by incubating 10 c.cm. of the filtrate, contained in a hard-glass tube, for three hours in the same water-bath; of this incubated extract 0.2 c.cm. was inoculated into the left leg of Bird 411. It is shown by this experiment that in two and a quarter hours the activity of the filtrate has been enormously diminished by the chloroform; in three hours abolished. But since the fowl died in nineteen days it might be argued that there was not sufficient time allowed for the dose of filtrate treated with chloroform for the full three hours to manifest its activity. To provide against such a source of error a second fowl was inoculated with 2 c.cm. of such extract; in four months it has not developed a tumour.

Thus chloroform acts very rapidly. This, however, applies only to the ordinary impure chloroform used for common purposes in laboratories. When pure chloroform is used the action is much slower. I am indebted to Dr. Howard Mueller of Harvard for the intimation that this might be so.

Acriflavine acts slowly. The experiment represented by Chart 2 illustrates this very well. It will be seen from this that 1 in 5,000 acriflavine is unable in three hours to abolish the activity of an extract of a tumour. When such experiments are carried on for longer times—for example, six hours—it is found that the activity is further diminished but not entirely abolished. In order to inactivate a filtrate it is necessary to incubate the mixture overnight, and this often introduces a complication: simple incubation at 37° C. for eighteen hours frequently robs a filtrate of its power to induce tumour formation. In order, therefore, to utilize the action of acriflavine in experiments of an analytical character it is necessary to devise other methods the details of which are omitted here for the sake of clarity.*

Two Factors: Both Necessary for Cell Infection.

We know that filtrates of the Rous tumour can be inactivated by heat and by antiseptics. By means of experiments such as that illustrated in Chart 3 it can be shown that the element destroyed by heat is not the same as that destroyed by acriflavine. The experiment shows that a tumour extract treated with acriflavine was quite inactive; an extract of the same tumour heated to 55° to 56° C. for eighteen minutes was also inactive. The two inactive fluids when mixed together acquired the power of inducing tumour formation.

The only criticism which can be passed upon experiments of this kind is that the chickens inoculated with acriflavine-treated extract happen to be naturally resistant, whereas the others are sensitive. This criticism, however, is not sound. The percentage of resistant birds cannot be determined absolutely, but it is, in any case, very small. Moreover, resistance is a graded quality. When the infective fluid is intensely active it is very rare to find a chicken resistant to its action. Only when the fluids which are inoculated are on the border-line of infectivity does one reveal differences in sensitiveness among any batch of chickens. The criticism, in any case, cannot apply to the next series of experiments, which are illustrated in Charts 4 and 5. In these experiments the same bird is used as control to the experiment. In the first experiment (Chart 4) the dose of acriflavine-treated tumour extract is the same in both breasts; the only difference between the two sides is that in the right breast the diluent is horse-serum broth medium, while in the left breast it is heat-inactivated extract of tumour. The quantities in such experiments as this are measured with the most scrupulous exactitude.

In the experiments represented by Chart 5 the controls, both of heat-inactivated and antiseptic-inactivated extracts, are included on the same bird. Similar experiments, with similar results, have been made with chloroform and with hydrocyanic acid as antiseptics.

From results such as these I am satisfied that the production of a tumour with cell-free filtrates depends upon the conjoint action of two elements of the filtrate. One of these is rendered inactive by acriflavine or other antiseptic, and is therefore presumably a micro-organism; the other is readily inactivated by heat. As we have seen, it would appear probable that the agent which is destroyed by heat is variable in quantity (or in quality) in filtrates from different tumours.

Chart 6, which illustrates eight similar experiments, shows that innocuous filtrates (that is, filtrates from a "non-filterable" Rous tumour) have the same property of reactivating acriflavine-inactivated extracts as have extracts which have been heated to 55° C. for fifteen minutes. It follows that inert filtrates are simply filtrates which contain none, or an insufficient amount, of this heat-sensitive but absolutely essential factor. This factor—which I have named the "specific factor," for reasons which will appear later—may be present in variable amount, and it is only because of its activity that the presence of a virus can be shown in the Rous sarcoma. When it is absent the Rous sarcoma, like the average bird and mammalian tumours, cannot reveal its "cause." The peculiarity of the Rous tumour is that it manufactures in varying degree this accessory thermo-labile substance.

It is evident from these experiments that the agent which is destroyed by antiseptics (the virus) is unable, acting alone, to induce sarcoma formation. This fact appears to me to be very simple. It has its analogies in general bacteriology, where the phenomena are more widely known and appreciated. But the fact, when established in research connected with the subject of cancer, is apparently regarded as a diabolical mystification of a plain and straightforward problem. It is but right to state here that Professor Borrel, the pioneer of experimental cancer research, has for twenty years held the opinion on general grounds that the essential cause of tumours is a virus which requires prolonged preparatory irritation of the tissues before its latent powers can be manifested.

The use of the word "cause" in medicine is unfortunate and is always liable to misapprehension. What is generally understood by the word is, I assume, a factor which must be invariably present in the etiology of a disease. We cannot, if this be the meaning understood, regard the specific factor as the cause of the Rous sarcoma, because it is sometimes absent. The virus—that is, the element which may be destroyed by an antiseptic—is, so far as my experiments show, always present in the tumour whether the tumour be very malignant or relatively benign. I regard the virus, therefore, as the cause of the sarcoma. Which of these two characters carries the specificity?

Substitution Experiments.

If an extract of the Rous fowl sarcoma be inactivated by heat and then there be added to it an extract of another tumour, the mixture does not induce sarcoma formation in the fowl or in the animal from which the second tumour was obtained—that is, a heat-inactivated extract of the Rous sarcoma cannot be restored to activity by the addition of simple extract of a rat or mouse tumour. But when an extract of a Rous sarcoma is inactivated by means of an antiseptic or by centrifugation, the activity can be restored by the addition of extracts of some other tumours.

* The details and protocols of these researches will appear in a series of papers in the *British Journal of Experimental Pathology*.

THE RECONSTRUCTIVE SURGERY OF THE HIP.*

Abstract of the Bradshaw Lecture.

BY

ERNEST W. HEY GROVES, M.S., F.R.C.S.,

PROFESSOR OF SURGERY, UNIVERSITY OF BRISTOL.

The hip-joint, the largest and most important in the body, presents special difficulties and special displacements. It is more liable to serious disease and congenital dislocation than any other joint. Possibly this may be due in part to the evolutionary change from the quadruped to the biped gait and progression.

Fracture of the Neck of the Femur.

Fractures of the true neck of the femur—that is, of the bone proximal to the intertrochanteric line—present very special features. Unless impacted these fractures never undergo natural union, and yet if artificial impaction is brought about, bony union will occur just as certainly as in any fracture elsewhere. Non-union, which is the natural event in these cases, is due to four causes—namely, want of apposition, poor blood supply, interposed capsule, and the action of the synovial fluid. Of these, the first two are by far the most important. If efficient treatment is delayed for more than a few weeks marked atrophy occurs in the proximal fragment, and after such an event perfect restitution either of form or function is impossible. The three essential points in the treatment are: early intervention, accurate apposition, and firm fixation. If these points are observed, firm bony union can be secured in practically all cases, whether in old or young.

The method advocated by Whitman is a great advance on previous modes of treatment. Under an anaesthetic the leg is pulled downwards, inverted and abducted, thus impacting the fracture. The abducted limb is fixed in a plaster spica for three to six months. The objections to this method consist in its uncertainty, and the very great torture and tedium of keeping an adult in a plaster case for several months. The uncertain result is due to the facts that manipulation of the leg cannot correct a misplaced proximal fragment, or get rid of that portion of the capsule which may lie between the broken surfaces.

Fixing the fracture by means of a bone peg gives a much more certain and perfect union with less strain upon the patience and fortitude of the patient. The joint is exposed by an anterior incision, the capsule opened, the fractured surfaces laid bare, the fracture accurately replaced by manipulation, and a square peg 4½ in. long by 3/8 in. thick driven from the base of the great trochanter through the neck into the head. The limb is put up in moderate flexion and abduction, steadied by slight traction. In six weeks' time the patient can walk with a calliper, and in three to six months can resume a normal life.

Special modifications of the pegging operation are useful in certain circumstances.

The peg may be inserted from above. This is useful when the proximal fragment is very small and the line of fracture difficult to expose outside the hip socket. The head of the bone is dislocated and nailed on to the neck, after which the bone is replaced in position.

In old cases, where the fracture is of long standing, it may be useful to employ a living bone peg, taken preferably from the fibula, because this type of peg will substitute some new bone in place of that lost by atrophy.

The peg may be inserted blindly—that is, without exposing the joint at all. This method should be reserved for patients whose age or debility makes it desirable to avoid the more serious operation. The drill hole into the neck and the insertion of the peg should be made under the guidance of the *x* rays. Conditions of slipped epiphysis should also be treated by the pegging operation, which is capable of restoring the bone to its perfect original form.

Ankylosis of the Hip.

There is no entirely satisfactory method of treating an ankylosed hip. It is comparatively easy to cure the patient of pain and to correct deformity, but it is extraordinarily difficult to secure mobility and stability at the same time, therefore only those cases are operated upon in which double ankylosis of the hips or simultaneous ankylosis of the hip and knee makes some treatment imperative. The more complicated methods of arthroplasty tend to leave the patient with a very stiff hip. It seems better, therefore, to be content with some modification of excision of the head of the femur. Two suggestions are made in order to secure both mobility and stability after this excision. To attain mobility, the capsular ligament is used as an envelope for the cut neck of the femur. To prevent the bone becoming dislocated the excised head of the femur is cut into two fragments and affixed to the upper margin of the acetabulum.

Congenital Dislocation of the Hip.

It is now generally recognized that early cases of congenital dislocation of the hip can be efficiently treated and cured by manipulation. But it is not realized that in older children when manipulative reduction is impossible a great deal can still be done by open operation to get firm and useful hip-joints. It is worse than useless to employ elaborate and difficult methods of manipulative reduction in these older cases. The main obstacle to reduction is the tight constriction of the capsule. No force or cunning can compel the head of the femur measuring one inch in diameter to pass through a thick constricted capsule presenting a channel of about a quarter of an inch.

Open exposure of the joint through an anterior incision makes it quite easy to reduce the dislocation after the constricted capsule has been slit open. The problem then arises as to the best methods of retaining the femur in its socket. In one method the acetabulum is deepened until it affords a socket sufficient to take the whole femoral head. This gives a very secure joint, but one which is liable to become stiff. In another method, that which has been most frequently used, the cartilage of the acetabulum is left undisturbed and a new rim is added to the socket by turning down a part of the outer surface of the iliac bone. In a third method the capsule is cut from its attachment to the pelvis and tied round the head of the femur, the acetabulum is gouged out, the head of the bone wrapped in the capsule is placed in the socket and anchored there by stitches which fix the capsule to the floor of the acetabulum.

In the late or adult cases of congenital dislocation a great deal can be done to cure both the pain and the lameness by a subtrochanteric osteotomy, putting up the leg in full abduction. But this is only suitable for unilateral cases. When the dislocation is bilateral, the head of one femur can be brought down into the socket by removing about two inches of the shaft of the bone below the small trochanter. This will give a firm hip on one side and the two legs will be of the same length. At a later date, if necessary, an osteotomy may be done on the opposite side.

Infantile Paralysis affecting the Hip Muscles.

Extensive infantile paralysis of the lower limb can to a large extent be made good by means of apparatus which fixes and controls the knee and ankle joints, but paralysis of the gluteal muscles leads to a complete inability to balance the trunk upon the leg and necessitates the permanent use of crutches. It has been suggested that the lost abductors may be replaced by using the tensor fasciae femoris or the erector spinae muscles. Neither of these muscles singly can make a very efficient abductor, partly because one lies in front and the other behind the required line of action, and, in the case of the back muscle, because of the difficulty in getting a necessary tendinous insertion. By combining these two muscles an efficient digastric abductor of the hip is formed. A long incision is made on the outer side of the thigh; the ilio-tibial band is isolated and cut above the knee; the fascial band forming the tendon of the tensor muscle is brought backwards through the base of the great trochanter; the erector spinae muscle is exposed by a vertical incision, and the lower portion

* Delivered before the Royal College of Surgeons of England, November 11th, 1926. The full text of the lecture will be published in the January number of the *British Journal of Surgery*.

well known antiseptic action of acriflavine. The extract of mammary carcinoma has, as I conceive it, provided a fresh supply of organisms which are able, in virtue of the presence of a sufficient amount of accessory factor of the fowl tumour, to infect the cells of the fowl inoculated.

These experiments show very clearly that the specificity of the Rous tumour extract is carried by the heat-labile

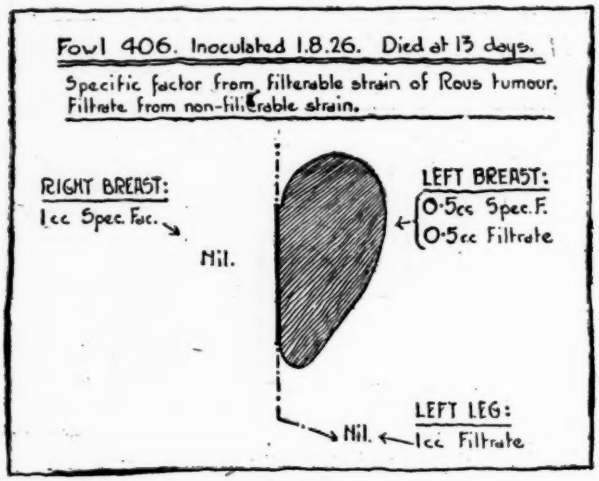


Chart 6.

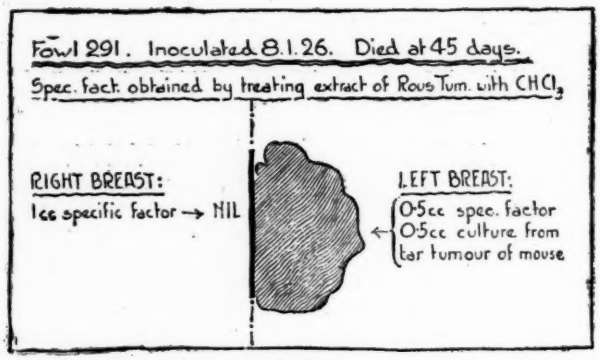

Fowl 291. Inoculated 8.1.26. Died at 45 days.
Spec. fact. obtained by treating extract of Rous Tum. with CHCl3
RIGHT BREAST:
1 cc specific factor → NIL
LEFT BREAST:
0·5 cc spec. factor
0·5 cc culture from
tar tumour of mouse

Chart 7.

agent, which has, for this reason, been called the "specific factor."

It has already been pointed out that extracts of normal tissues do not provide the agent which reactivates antiseptic-treated extracts of the Rous sarcoma. But certain tumours, one of which is a sarcoma of the mouse, have so far invariably failed also. This is one of the most puzzling facts yet met with, and I have no explanation which accounts for it satisfactorily.

The evidence that the agent which is extractable from many bird and mammalian tumours, and which has the power of restoring activity to inactive extracts of the Rous tumour, is a micro-organism is as follows: first the agent is killed by antiseptics, and secondly, it can be cultivated. The proof of cultivation is obtained by the method described in a recent publication—namely, by using as a medium serum broth to which is added a fragment of embryonic tissue. Chart 9 shows the method of experimentation adopted. Acriflavine-treated extract of Rous sarcoma is prepared; to measured portions of this are added in series: (1) a sample of serum-broth-embryo culture medium, (2) a sample of a subculture in the same medium, and (3) samples of a subculture in different media. Quantities are measured precisely. The result of the experiment represented by Chart 9 shows that the agent from a rat carcinoma survived in horse-serum-broth-embryo and in horse-serum broth, but not in broth-embryo; it was not present in the horse-serum-broth control tube, which had been incubated for the same period of time as the cultures. Continuing with subcultures in this way, tumours have been obtained with remote (seventh) subcultures in media which contain embryo tissue. But there is a criticism which has been applied, and quite fairly, to these results: it is that possibly we are here dealing with a phenomenon similar to that discovered by Twort and now known as the "bacteriophage phenomenon." It is possible to argue that successive inoculations into tubes which contain living embryo induce repeatedly the production of the agent from the cells of the embryonic fragment. This is not impossible, but it is very improbable. It must, of course, be settled before the last element of doubt has been removed.

Conclusions.

Does this new knowledge bring us any nearer to the solution of the problem set forth at the beginning of this lecture? And further, is the answer compatible with the known facts of cancer structure and behaviour?

It seems to me, after considering the problem very thoroughly—and I hope with a sound knowledge of the accepted facts—that in the first place there is no incompatibility between new and old "fact"; and in the second place it shows that there is an agent contained in tumours of diverse origin and of diverse structure which has the supremely important property of reactivating an extract of the Rous sarcoma which has been inactivated by means of an antiseptic. The tumours in this respect are therefore linked together in a way which had never before been suspected; they are, indeed, a natural group. The agent which is common to these and which links them together

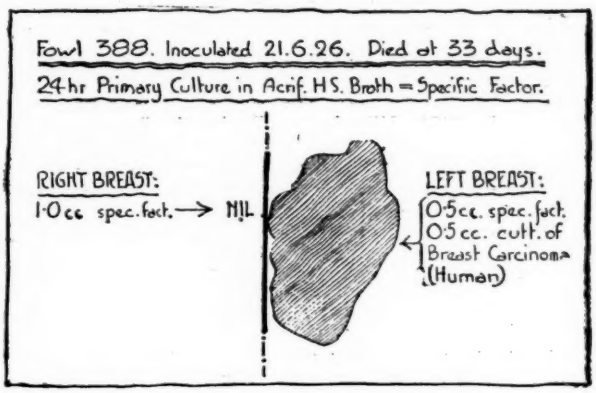

Fowl 388. Inoculated 21.6.26. Died at 33 days.
24 hr Primary Culture in Acrif. H.S. Broth = Specific Factor.
RIGHT BREAST:
1·0 cc spec. fact. → NIL
LEFT BREAST:
0·5 cc. spec. fact.
0·5 cc. cult. of
Breast Carcinoma
(Human)

Chart 8.

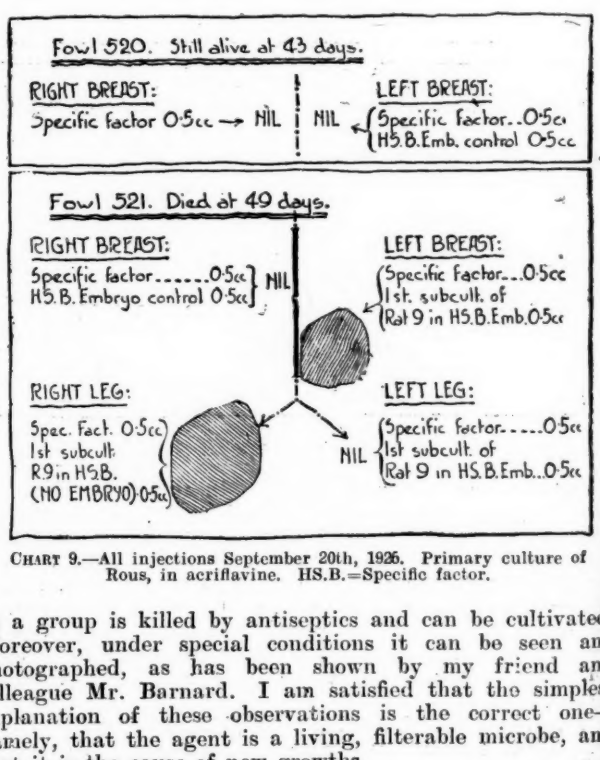


Chart 9.—All injections September 20th, 1926. Primary culture of Rous, in acriflavine. HS.B.=Specific factor.

in a group is killed by antiseptics and can be cultivated. Moreover, under special conditions it can be seen and photographed, as has been shown by my friend and colleague Mr. Barnard. I am satisfied that the simplest explanation of these observations is the correct one—namely, that the agent is a living, filterable microbe, and that it is the cause of new growths.

demonstrable seems to me a flat defiance of all relevant experience in medicine.

The view that neurosis and the depressive psychosis are continuous, and that both are associated with lasting bodily anomalies, is not, of course, in the least inconsistent with believing that the traces of unpleasant experience are one of the principal causes of both, and that other mental experiences may be curative. It is in fact a wider and less eclectic view of psychogenesis and psychotherapy—not in the least a denial of either. It would need an extreme degree of clinical blindness to ignore the fact that in a very large proportion of both neuroses and psychoses of the depressive type the attack is directly related to stress, and as a rule the exact emotional anomaly corresponds to a morbid protraction of what the circumstances would naturally cause. Often there remains undue susceptibility to the same emotion—for example, after one attack of anxiety with fairly adequate reason, a liability to terror from all sorts of trivial causes. Frequently one finds the topic of the first attack reproduced in later ones, though there is nothing common in the patient's circumstances at the two dates except his mood. Many cases, even in the first attack, show regressive prominence of events of the early life, tinged with the same emotion.

On the other hand, events justifying one depressive emotion—for example, grief—may cause relapse of another somewhat different depressive type—for example, fear, to which the patient has become habitually liable.

Attacks of mania and melancholia are very often obviously decontrol of tendencies just inhibited when the patient is at his best. On the other hand, many attacks of acute mania are clearly examples of over-reaction to catastrophe. It is arguable that all mania is of this type, even when hypomania is temperamental. The phenomena seen in manic-depressive psychosis and allied neuroses are obviously related to those of habit, decontrol, and contrast, as otherwise exhibited in the nervous system. In view of this it seems to me a counsel of despair to urge contentment with conceiving them in terms of struggles between such entities as the conscious and unconscious mind except as a temporary expedient.

VARIATION OF THE DEPRESSIVE SYNDROME.

(*a*) *In Ratio of Positive and Negative Symptoms.*

In the depressive type of psychosis there is great variation in the ratio between the excess of affective response and the reduction of conative and intellectual activity in relation to the outer world. In many cases, at least in some depressive attacks, these negative symptoms are the salient feature. This state of things reaches its height in anergic stupor. At the beginning or end of an attack it is common to find as the main symptoms difficulty of concentration and of recollection, loss of interest and pleasure in life and of all enduring feelings, a sense of unreality of the world and strangeness of the self, lassitude, fatigability, and hatred of effort and responsibility. All these may be accompanied by perfect insight; usually there is some tendency to exaggerate the objective disabilities, but insight even into this tendency.

Many neuropaths show this syndrome in a single attack, repeatedly or chronically, and never exceed it. It then seems to correspond to what may best be included under the overstretched heading of neurasthenia.

(*b*) *In Type of Emotion.*

When depression is well marked its exact form varies greatly—grief finding causes for unhappiness in the past, fear which seeks them in the future, and a simple sense of wretchedness about the present seem the primary types. The melancholic is, of course, apt to experience all these varieties of depression; which type predominates seems in part a function of recent circumstances, if any, precipitating the present attack or the first of his life. In part, the mood expresses the individual temperament as determined by the interaction of inborn constitution with the sum of experience, remote as well as recent.

Anxiety neurosis has achieved a persistent acceptance even among the large majority who reject Freud's views as to its causation. There seems no particular objection to isolating it if it be regarded as merely one of the numerous subdivisions of the manic-depressive group. But it merges in the same patient, and by a perfectly continuous gradation in a series of patients, into agitated melancholia. Almost as much could be said for recognizing grief and wretchedness neuroses. It would be easy to construct a table of symptoms analogous to those seen in anxiety neurosis, but coupled with grief and associated with insight into their morbid nature. We have all seen the patient exasperated by tears for which he can ascribe no cause, and obsessed by sorrowful memories despite the fullest recognition of the futility of dwelling on these. Remorse, which provides at once a reason for depression past, present, and future, is about the commonest form.

(*c*) *In Intellectual Concomitants.*

Grief, misery, or fear is apt to make the patient remember events, magnify perceptions, and anticipate prospects that are in keeping with itself. Insight is not only graded in various patients, but also varies immensely from time to time. It includes insight into the morbidity of the emotions and of the rationalizations to which these incline the patient. In a surprising number of even the severest cases of melancholia there are no delusions, merely a formless sense of one of the three types of distress which I have mentioned. Hallucinations and delusions in the melancholic are usually related to a foundation of fact, though it may be a frail one; they show chiefly a distorted sense of proportion and probability. Often there is merely a regressive prominence of some congruous memory without delusion. Obsessions are common in these cases, but, like the delusions, are as a rule of the readily intelligible type.

(*d*) *In Psychomotor Accompaniments.*

Grief, wretchedness, and fear in the melancholic may alike find expression in mute prostration or in various forms of futile activity, exaggerating those seen in the normal affected by similar emotions. Such differences have formed the basis of much traditional subdivision of melancholia—for example, into agitated, resistive stuporose, and so forth. The one patient is apt to vary in the course of a day in these respects.

Transition between Manic-Depressive and other Syndromes.

Next we must recognize that cases which are mainly manic-depressive may from their beginning present certain features resembling dementia praecox or come to develop these. Other types of reaction than the schizoid may be combined with the syntonic. One may see the typical failure to recognize the outer world and liability to hallucinations characteristic of confusional states. The paranoid reaction may also coexist in varying measure with either mania or melancholia. In either case hostility is the keynote. The distinction from the simple melancholic reaction consists in the attitude to misfortune—acceptance as retribution or ill luck in the one, and resentment as injustice in the other.

Modern psychiatry is at last losing its passion for multiplying descriptive categories, which has been so often parodied. We are moving towards a recognition of the fact that the task of psychopathology is to isolate a few fundamental types of anomalous reaction for which a physical basis can be sought. Among these are the two syntonic types, the confusional, the schizoid, the paranoid, and the hysteric. These are not regarded as separate diseases comparable with measles and scarlet fever, or with tabes and disseminated sclerosis. Each may result from numerous causes, and generally does result from a combination which can give rise to several anomalies of reaction, and often initiates a mixture of them in one patient.

Physical Basis of Manic-Depressive and other Functional Psychoses.

It is at least conceivable that some of the primary modes of abnormal mental reaction correspond to fairly definite bodily changes, perhaps to particular systems of neurons which we shall some day be able to identify. The combination of more than one type of anomaly in most cases would then be somewhat analogous to the situation in amyotrophic lateral sclerosis or in tabo-paresis.

Attempts to conceive the physical basis of the various reaction types are of course purely speculative, but recognition of their nature at least saves us from the misleading

isolated by cutting through its lower origin and splitting this part of the muscle upwards for about four inches; the ilio-tibial band is brought backwards and upwards through a tunnel under the skin and fixed to the isolated part of the erector spinae muscle.

British Medical Association.

PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, NOTTINGHAM, 1926.

SECTION OF NEUROLOGY AND PSYCHOLOGY.

E. Farquhar Buzzard, M.D., F.R.C.P., President.

DISCUSSION ON MANIC-DEPRESSIVE PSYCHOSIS.

OPENING PAPER

BY

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The task of introducing for discussion the subject of the manic-depressive psychosis has an engaging but spurious air of simplicity. The disorder arouses a natural sympathy and interest in normal people. The anomalies of the patient have none of that apparently meaningless and inexplicable quality which makes the schizophrenic so remote and renders so improbable the truth that he once thought and acted like ourselves. On the contrary, if the term "manic-depressive psychosis" is used in any but the narrowest sense it is obvious that in many cases we are dealing with a merely quantitative deviation, that the disturbance consists in a response similar in kind to that which like circumstances might provoke in us, but morbidly prolonged or disproportionate or disastrous in degree. Even if we were to confine the term to those cases showing apparently spontaneous mutations of mood and activity there are few of us without personal experience of analogous phases.

In handling the practical problems of causation, diagnosis, prognosis, and treatment it is impossible to be both comprehensive and detailed. I shall aim at raising points for discussion, but if at times I express myself dogmatically I hope this will be recognized as merely provocative.

Delimitation of Manic-Depressive Psychosis: Relation to Neuroses.

The primary problem is what meaning should be attached to the term "manic-depressive psychosis." There is no constant and specific cause, and no distinctive bodily change recognizable during life or after death. The range of the term is a matter of convention; at present there is no agreement, and no one with the authority to impose one. Yet all discussion, at least as to the problems of causation, diagnosis, and prognosis, must depend on delimitation. All would probably agree that under the heading of "manic-depressive psychosis" are included cases of functional mental disorder which show as their predominant features one of a contrasting pair of anomalous types of reaction.

I. The depressive reaction comprises (*a*) Morbid dissatisfaction (with the self or circumstances) in one of its varieties; colouring of thought and action thereby; persistence or hyperexcitability of various alternative reactions (psychomotor and visceral) expressive of the mood. (*b*) A sense of difficulty in thought, action, and feeling of all other kinds and a varying true incapacity for activity in relation to external reality.

II. The manic reaction comprises: (*a*) Morbid satisfaction (with the self or circumstances); colouring of thought and action thereby and objective expressions of this mood. (*b*) Fallacious sense of power and misdirected hyperactivity.

The question, however, which immediately arises is whether all or only some such cases should be included; whether it is necessary to limit the application of the term by reference to varieties of these symptoms, their intensity, time relations, and causes, or by such criteria as insight and amenability to treatment. It will be generally agreed that subdivision in virtue of details of the known (for example, of past course and present symptoms) serves little purpose unless the types discriminated are correlated with differences in the unknown—for example, in causation, prognosis, or treatment. The term originated in the attempt of Kraepelin to establish a correlation between certain syndromes and course, between transverse and longitudinal section in the severer psychoses. Hence Kraepelin's invention of the category manic-depressive psychosis as one of the standard types to which cases of grave mental disease more or less conform.

It was emphasized that cases of the manic-depressive type did not in most instances tend to dementia between attacks or even after a number of such. It is doubtful whether this is more than a truism which could be briefly expressed in more modern terms by saying that in a given patient there is no strong reason to anticipate marked and terminal schizophrenia in the absence of minor and early changes of the same kind. Nevertheless cases presenting the manic-depressive syndrome in absolutely pure form during their early stage do sometimes end as typical dementia praecox.

In earlier years spontaneous occurrence—that is, lack of traceable relation to any external causes—was one of the features ascribed to typical manic-depressive psychosis, but in fact the degree to which internal and external factors co-operate is infinitely variable.

It is unproven and improbable that any mental syndrome is due to a specific cause, and consequently there is no more likelihood of a constant course in mania or depression than in jaundice.

Kraepelin himself in later years has fully recognized that in addition to the striking cases of almost purely affective disturbance reaching the intensity to which we commonly give the name of a psychosis and showing a clear-cut phasic course there are many others. We see cases in which chronic anomalies, like in kind to those of the attack though varying infinitely in degree, are present before or after. These cases merge into those where constitutional symptoms of one kind or the other are pretty constantly present and undergo mere fluctuations. Thus there is a complete gradation to certain minor disturbances which, whether continuous or phasic, are usually termed neuroses.

Kraepelin, if anyone, has the right to settle what conditions the term "manic-depressive psychosis" shall connote. He has come to the conclusion that it is simplest to include all cases showing the affective excesses and also the "syntonic" types of intellectual and conative disorder to which I have referred, and this regardless of their intensity and time relations. He has not been followed by all who have borrowed their names and ideas from his earlier work, but personally I entirely agree with his later views in this matter.

The distinction between what are termed neuroses and psychoses has really grown out of practical differences, particularly as regards certification and asylum treatment. It has become customary to call those types and degrees of mental disorder which rarely call for such measures by the name of neuroses. I can find no other basis for the distinction; neither insight, nor co-operation in treatment, nor susceptibility to psychotherapy will serve.

I am aware that this view will probably be challenged. There is a small group who insist on importing animism into psychopathology. Most of these authors seem to propound the paradox that mental disorders are disturbances in the nervous functions and structures, while what we term neuroses are disturbances of an entity called mind without persistent physical basis, though others, including McDougall, would, I believe, include manic-depressive psychosis in the latter category. In spite of the profoundest respect for those who hold these theories, and in spite of the traditional upbringing during childhood, I confess that these views now convey no meaning to me. We admit the mystery of consciousness, but to assume that an enduring physical basis for habitually abnormal behaviour is probably non-existent because at present its exact nature is not

Course and Prognosis of Manic-Depressive Psychoses.

Under this head I shall confine myself to principles and omit figures, which would need so much explanation and qualification as to be impossible here. I am aiming at a few hints for individual prognosis rather than statistics.

Many deaths occur which are mainly due to melancholic states; they are apt to figure in certificates under the heading of terminal complications. In some the death is almost inexplicable; the patient is taking an ample supply of food and not extremely restless or sleepless, but weakness and wasting progress. Investigation of these cases is badly needed. Their number is, of course, trivial compared with those of lives saved—a fact to be remembered in these days of abuse of the mental hospitals.

Seen at the beginning of an attack the questions quite reasonably asked by relatives are the following: its probable length; the chance of preliminary intensification; the likelihood of cure or persistent abnormality. In the event of persistent abnormality, what is likely to be the degree of this? Whether abnormality persists or not, what is the probability of further acute symptoms? To all these questions we can only give the vaguest answers. Though we cannot concede that there is any special spontaneous form of syntonic psychosis, yet it is certain that in many cases there is a phasic state of susceptibility to experience the basis of which is as mysterious as the readiness of a plant to respond to conditions in the spring and autumn.

Again, though it is impossible to discriminate groups in virtue of susceptibility to treatment, yet at times the emotional excess, even if started by shock, attains a sort of independence, and is as certain to persist and even get worse for a time despite all treatment as the symptoms of a case of typhoid in the first week. In recurrent manic-depressive attacks the duration of both attacks and intervals is usually quite irregular. Abrupt onset and termination are rare. So far as I have seen, cases in which excitement or depression approaches a possibly certifiable degree and lasts less than two or three months are also rare; possibly more such may get well in nursing homes and observation wards than is suspected. I should be interested to hear the experiences of others. Far more than half the recoveries occur in the first year, and the large majority of the rest in the second year.

In attempting individual prognosis three sets of facts must be considered: details of present symptoms, etiology, and course up to date.

The two elements of the melancholic reaction—the intellectual and conative reduction without disorder, and a fundamental affective disturbance capable of elaboration into grief, misery, or fear—seem the primary response in most mental cases to any noxious influence, whether a situation or a physical stress. Most other reactions are secondary, so that we can say that the major part of psychiatry is the study of morbid unhappiness and how people show it and mask it. Every future is possible in a young person seen for the first time in a manic and still more in a depressive state. If symptoms remain confined to the syntonic type then permanent recovery is more common than with any other type (except perhaps the confusional), and so is complete intermission with recurrence (both results, of course, may occur with any form of reaction). Estimation, therefore, of the degree in which the syntonic is mixed with paranoid and schizoid signs is very important. Such intermixture if absent at first may develop later. Pure chronic mania without any element of these reactions is a rarity; pure chronic melancholia less uncommon. It is necessary to consider the special significance (*a*) of the different types of emotion—grief, wretchedness, and fear; (*b*) of various motor accompaniments—stupor, restlessness, resistiveness; (*c*) of insight, delusions, and hallucinations. These features have relations to other factors, such as age and causation, which more directly affect the prognosis.

Bodily symptoms are often the best indication of coming recovery. Improved appetite and regularity of bowels, sleep, clearing of the complexion, increase of weight, and return of menstruation may be noted even before any increase of activity, and long before any admission of feeling better can be extracted.

In regard to the relation of prognosis to etiology, we recall that neuropathic inheritance decreases the probability that the attack will be a transitory isolated episode. But the chance that recovery and no dementia will follow a given attack is greater when it is known that the family disorder has usually been of the phasic type. This may be a fact of great practical importance. A personal history indicating mere emotional instability has the same prognostic value as similar family history. Abstraction, sullenness, or eccentricities suggest schizoid tendencies; suspicion and conceit, paranoid ones. The prognosis of puerperal psychoses is good, but they are very liable to recur with childbirth. The idea that anything but mild disturbances which start about the menopause are specially likely to clear up with its completion seems to have little foundation.

The prognosis of recurrences even in advanced age is good in the absence of arterio-sclerosis and evidence of dementia. First attacks in the involutional period are apt to be more prolonged, but eventually clear up in two-thirds of cases. Again, excluding arterio-sclerosis, prognosis is ultimately only unfavourable if there are schizoid or paranoid features.

The graver psychoses precipitated by really severe mental stress are apt to be syntonic rather than schizoid. *A priori* one might expect that the resilience of a person thoroughly normal until broken by exceptional disaster would assert itself, and therefore that recovery would be exceptionally frequent in such cases. I have noted a statement to the contrary in Maudsley's *Pathology of Mind*, and there is, of course, an old saying about the effect of storms on oaks and reeds. I believe the chances of the weakling upset by trifles are the better.

It must be admitted that by far the safest recipe for the psychiatric prophet is a judicious use of the probability that what has steadily progressed until now will continue to do so; the outlook is good in proportion as the onset was stormy, bad when it was insidious. The proportion of ultimate recoveries will be much greater among a group of cases seen within one month of onset than in a group seen after six months, and this for natural reasons without regard to treatment. A patient who has recovered once will probably do so again.

DIAGNOSIS.

Having excluded organic disease, diagnosis includes:

1. Exact estimation of the degree in which all causes interact in production.

2. The problem of the exact proportion in which various reaction types are traceable.

3. Consideration of how far various kinds of syntonic anomaly are present.

4. Determination of practical probabilities—for example, in acute attacks the dangers of exhaustion and injury to self or others, the suitability for voluntary treatment; in quiet phases, fitness for work and likelihood of benefit from this.

For exclusion of organic diseases there are only two requisites—complete examination and a sound knowledge of neurology. Details of mental states are entirely unreliable. There are cases of general paralysis that no one, however expert, can distinguish from neurasthenia or from true mania without a Wassermann test of the cerebro-spinal fluid. Encephalitis is frequently responsible for aimless unemotional restlessness, but very rarely in my experience for true mania. Diagnosis, however, from functional melancholia is often extremely difficult. It should be made only on such grounds as history of a febrile attack with characteristic drowsiness or ocular palsies, or on presence of physical sequelae—most commonly Parkinsonism. Profound depression is very common after encephalitis, and many such cases are desperately suicidal; motives are sometimes, though not always, delusional. Parkinsonism may be very difficult to distinguish from the retardation of some types of melancholia. Motor restlessness like that of the senile is common in children after encephalitis, but emotional exaltation of the manic type is a very rare sequel.

The other organic conditions most commonly responsible for syndromes of the manic-depressive type are arterio-sclerosis, alcoholism, endocrine disorders (especially Graves's

simplification called "making a diagnosis" as between various functional psychoses and neuroses. This does not exclude the possibility that the degree in which various reaction types are present may be empirically correlated with certain courses.

Such evidence as there is regarding the physical basis of dementia praecox and manic-depressive psychosis supports the view which I have put forward. Most of the earlier changes described in both are not peculiar to any disease, but accompaniments of the behaviour or emotion displayed, or secondary results of these. Such will, of course, be seen alike in manic-depressive psychosis and dementia praecox. Among these may be instanced the loss of weight due in many cases to insomnia, restlessness, and starvation; glycosuria, which may occur with all forms of normal or morbid excitement; and leucocytosis of the type associated with exercise. Blood pressure also is probably parallel to mood and behaviour.

Numerous physical changes have been described of late years by Sir Frederick Mott and Dr. Golla, and by Dr. Isabella Robertson working with them in the Maudsley laboratory, as occurring in the functional psychoses, which seem independent of behaviour. They are found in manic-depressive types as well as in dementia praecox. These changes include histological ones in the cortex cerebri, gonads, adrenals, and pituitary body. Specific relation to the functional psychoses seems fairly certain (though it has been denied), but differences between manic-depressive and dementia praecox are only questions of constancy and degree. This agrees with clinical facts such as that amenorrhoea is common in both. It is opposed to the alleged finding in dementia praecox alone of protective ferments against breakdown products of cerebral cortex and gonads by the Abderhalden reaction; but the value of these findings is very doubtful. It is likewise true that such intra-vitam reactions as the haemoclasic crisis, absence of the alkaline tide, abnormalities in composition of the alveolar air after food, in gastric secretion, and in blood sugar, are common to both. Changes in basal metabolism peculiar to dementia praecox and in nitrogen excretion peculiar to manic-depressive have been described, but difficulties of technique make these results very questionable.

Etiology of Manic-Depressive Psychosis.

The problem is really the double one of tracing separately an exciting cause and a predisposition or susceptibility.

Of exciting causes shock in the absolutely normal is rarely sufficient, but even if we confine our attention to cases of certifiable severity a recent serious mental stress to which the attack is really traceable is found in quite 50 per cent. Probably the proportion would be much higher if slight cases were considered. In saying this I have due regard to alleged causal episodes that are symptomatic or results of the psychosis or coincidences or commonplace or merely untrue.

I hesitate to refer to such banalities as exciting mental stresses in these days when the quest of the obscure and the terror of the obvious has become a cult; when nothing can be too trivial to be of revolutionary importance if only it be sufficiently remote. Of these banalities the death of husband or wife seems far the commonest to me, probably because of the usual age of occurrence. Financial worries come next, and are often combined with the former cause. More romantic episodes, such as disappointment in love and illicit pregnancies, are a bad third. The insanity of a near relative is a very common determinant in my experience. I have seen seven instances in the last three years where sudden development of insanity in one patient has been followed by melancholia in a brother or sister, or in a husband or wife. This seems by far the commonest type of *folie à deux*.

Though shocks are more potent, I think the modern fashion of minimizing intellectual overwork as a cause of mental illness has gone too far, but separation of this from worry is generally more theoretical than real. As one would guess from experience of ordinary humanity, performances that might reasonably cause shame are less prone than misfortune to originate melancholia, and more likely to originate paranoid reactions. Remorse is common in melancholia, but mostly about remote or trifling episodes.

Now as to the fundamental susceptibility to experience or apparently spontaneous affective excess in which the disease consists. We have no knowledge of its essential basis or whether this is in or out of the nervous system, though this is an enormously important question. In considering causation of mental disorder we must always think of four groups of factors: (1) the innate structure of the whole organism and corresponding tendencies; (2) the stage of evolution reached and influence of physiological epochs; (3) mental experiences (recent and remote); (4) physical influences (recent and remote).

I fear we have not progressed far beyond saying that the essence of the manic-depressive diathesis in most cases is an innate and often inherited tendency. At least, we do know that the grouping of cases does not obey the laws of chance but shows family distribution, and that there are families in which the manic-depressive tendency occurs in extraordinarily pure form in numerous members, both in the same generation and in successive ones. These are the well known families where numerous suicides occur and often where exceptional ability is combined with insanity, which is never of deteriorating type. It is a relatively minor point whether such family disposition originates as a spontaneous variation in the germ plasm or, as Myerson suggests, is a heritable modification by injurious action upon the germ plasm of something external (blastophoria).

I wish to discuss briefly the relation of the susceptibility constituting the essence of manic-depressive psychosis to primary disturbances of internal secretion and to infection. Similar mental syndromes often occur with obvious endocrine diseases having bodily symptoms—particularly Graves's disease; they often follow febrile infections, especially influenza. Such neuroses and psychoses, however, are excluded by definition if one limits manic-depressive psychosis to functional conditions.

The attributing of neuroses and psychoses without characteristic bodily changes to primary endocrine disturbances, which has been so popular of late years, is pure speculation. Whether the demonstrable changes in glands are causes, concomitants, or consequences of the nervous lesions is unknown; treatment provides no clear evidence.

Of late years there has been a boom in afebrile focal infection as the cause of neuroses and psychoses. The sites from which it is alleged to be derived are chiefly nasal sinuses, and ear, mouth, teeth, tonsils, stomach, and intestines, the urinary tract, uterus, and vesiculae seminales.

So-called detoxication, including very drastic surgery and vaccine therapy, has had some vogue. The most prominent exponent of this view has been Cotton. He minimizes the effect of heredity and of remote experience, and, though admitting that recent mental stresses may precipitate psychoses, he maintains that "they are due to a combination of many factors, but the most constant one is the intracerebral biochemical cellular disturbances arising from circulating toxins originating in chronic foci of infection situated anywhere throughout the body, associated probably with secondary disturbances of the endocrine system."

Cotton claims astonishing results from detoxication, and a large proportion of these results are in the affective psychoses. It is certain, as Cotton says, that psychoses are generally due to a complex of causes, and probable that latent infection may be one of these in a group of cases, but there is little reliable evidence that it is a large group. Cotton's treatment, repeated by others with control cases, does not reproduce his results. Recovery occurs with the same frequency with and without special treatment directed to focal infection in two series of similar cases. Similar infections are also present in large numbers of people who show no tendency to mental abnormality. Proof that toxaemia is really occurring is almost absent. It proves nothing to show that there is intestinal stasis in melancholia by skiagraphing a bismuth meal. The stasis is more likely to be a symptom than the cause of melancholia. Goodall's review of work done in the examination of blood and cerebro-spinal fluid, of urine and faeces, lends no support to the infective theory of functional psychoses. Almost the only feature suggesting infective origin of manic-depressive psychosis is the leucocytosis sometimes associated with progressive phases.

DISCUSSION.

The PRESIDENT said that in choosing manic-depressive psychosis for discussion by this Section it was felt that the time was ripe for the subject to be reviewed by an authority such as Dr. Mapother. Those present had listened to a paper full of instruction, information, and suggestion, with the additional merit of being controversial, and perhaps even provocative. Dr. Buzzard believed that this psychosis in its mild and moderate forms was a very common, if not the commonest, mental disorder; it was rarely recognized, except by experts; but its recognition was a matter of great practical importance in relation to prognosis and treatment. It was as common as migraine, which it resembled in some etiological particulars. As in the case of migraine, the hereditary factor loomed large. Manic-depressive psychosis was rarely met with except in families with definite psychopathic taint. Its manifestations varied greatly in their degree of severity and in their periodicity, but made their appearance chiefly during the years of active sexual life, with a tendency to exaggeration towards its close. As little was known about the exciting causes of its attacks as about those of migraine. There was no reliable cure, although a large percentage of patients recovered. Dr. Buzzard disagreed with Dr. Mapother's statement that anxiety neurosis had achieved a persistent acceptance even among the large majority who rejected Freud's views as to its causation, and that there seemed to be no particular objection to isolating it if it was regarded as merely one of the numerous subdivisions of the manic-depressive group. When a patient complained of depression, loss of energy, decision, interest, and concentration, and presented no signs of organic disease, the question which arose in a large majority of cases was the discrimination between a manic-depressive psychosis and an anxiety neurosis. He submitted that the distinction between these two conditions, although sometimes difficult, was of fundamental importance in regard to prognosis and treatment, as well as in the interests of academic accuracy. If he came to the conclusion that the patient was a manic-depressive, Dr. Buzzard regarded his recovery as more or less assured, but at an uncertain date. He was concerned that the patient should be safeguarded against possible suicidal tendencies, that he should have constant sympathetic care and encouragement, and that he should be protected from any form of analysis. Help in regard to sleep, feeding, and environment might be necessary, but of direct curative measures he admitted complete ignorance. In short, he recognized that the patient was the victim of a disorder in which physical and mental symptoms were closely associated, and perhaps interdependent, and that he required all that his doctor could give him of time, patience, and assistance until Nature restored him to health. The doctor who was in charge of the patient when he recovered, and the treatment prescribed, would gain the credit of a cure—a credit which would in all probability fail to survive the next attack. If, on the other hand, Dr. Buzzard came to the conclusion that the patient was suffering from an anxiety neurosis, he regarded his recovery and its date as dependent on the ease with which his anxiety could be disclosed and on the success of any measures directed towards its removal. He had little fear of suicide, and no dread of skilful analysis. In other words, he realized that the condition was a mental disorder which could be directly attacked, and that the disappearance of any physical symptoms of which the patient complained would coincide with the restoration of his peace of mind.

These alternative conclusions might be fallacious in conception and reached on inadequate grounds, but if they were a guide to prognosis and treatment, how could they be reconciled with the view that anxiety neurosis should be regarded as merely one of the numerous subdivisions of the manic-depressive group?

The question of diagnosis was sometimes easy, sometimes very difficult. In the first place, a very careful and detailed history was as essential here as it was in the diagnosis of any disorder, physical or mental. In the second place, he would stress the loss of interest in all pursuits and of affection for all persons exhibited by the manic-depressive on the psychical side and the change in his appearance, colour, and smell on the physical side. Disturbances of sleep were less profound and less difficult to overcome in the manic-depressive than in the patient suffering from anxiety neurosis.

Last, but not least, it was always possible to find a cause for an anxiety neurosis, while it was often impossible to discover an adequate reason for a depressive phase in a manic-depressive.

Dr. Buzzard hoped that efforts would be made to popularize what knowledge they possessed about a very common malady, and one which was of as much interest and importance to the general practitioner as to the consultant in psychiatry or neurology. He had already contended that the name of this psychosis was a serious bar to its general recognition, and in conclusion he felt he could hardly do better than commend to the members of the Section as a holiday task the discovery of an alternative and less objectionable title than that of manic-depressive psychosis.

Dr. T. A. Ross (Penshurst) joined issue with that part of Dr. Mapother's paper in which he identified the psychoneuroses with the psychoses. For Dr. Mapother to attempt to distinguish between them was a useless exercise, although he admitted that the attempt to do so had grown out of practical differences, particularly as regards certification and asylum treatment. Dr. Ross confessed that if he were suffering from a condition which might or might not at some future time lead to detention and loss of liberty he would be glad to have a physician who would engage in the useless exercise mentioned. He had long wondered how Dr. Mapother had been led to the conclusions he held, and he thought that to-day he had solved this problem. Dr. Mapother had said that details of mental states were entirely unreliable; the investigation of them was, therefore, to his mind a useless exercise. Dr. Ross thought that if Dr. Mapother would carefully study mental states he would find that they would lead him to perceive fundamental differences between the psychoses and psychoneuroses. It was rash to call any clinical examination a useless exercise. When the speaker was a student the plantar reflex used to be examined to see whether it was present or absent. It was then a perfectly useless exercise for most people, but one man at any rate had since made something of it.

Dr. Ross wished to put forward some proof that their study did as a matter of fact lead to something demonstrable, something of value. He proposed to take as a criterion the fact of certification. At once it would be said that certifiability was a legal and not a medical question; that was only partly true. Certification was an admission that the patient in question was so far removed from mental health that he could not be dealt with without deprivation of liberty. Certification depended also on social status; it was not fair to compare the numbers of certifications of the poor with those of the rich; the poor required certification for less illness than the rich. But the figures he would put forward were all drawn from substantially one class—there were no rich among them. Since the Cassel Hospital opened they had 66 patients who were definitely labelled by them as manic-depressives. They were not sent as such. Most of them were labelled neurasthenics; none were then certifiable. The diagnosis from a psychoneurosis was made on an examination of the mental state. Of these patients 12 had since been certified, and 3 others who unfortunately were not certified had committed suicide. During the same period 355 patients definitely diagnosed at the Cassel Hospital as suffering from one or other form of psychoneurosis were admitted; of these, 3 had since been certified. Two of these, had Dr. Ross followed his own rules, he would not have put into these groups. In one case he was warned that he was making a mistake—that the patient was really a manic-depressive. The other displayed symptoms which certainly put him into that group. But if not allowed to transfer them, three errors of diagnosis out of 355 patients—less than 1 per cent.—were insignificant. Even if it was impossible to be sure in less than 1 per cent., when it could be shown that over 20 per cent. of those diagnosed as manic-depressives would need asylum treatment, the "useless exercise" seemed worth trying.

As regards the important points in the diagnosis. He would begin with a mental symptom, which Dr. Mapother

disease), and obvious infections such as influenza. These will not be missed if the need to look for them is borne in mind.

Treatment.

Treatment of mania will naturally differ from that of melancholia. But there is more difference between the management of cases during attacks and exacerbations on the one hand, and in more or less stationary phases on the other.

The essence of an attack or exacerbation is the clinical fact that emotions for the time have lost enduring relation to current experience, and whatever their origin and intensity they have achieved a sort of autonomy. We must recognize that at present the length of such attacks is largely out of control, that treatment must be symptomatic rather than specific, its objects being to safeguard life, relieve distress, and provide the condition in which natural processes will have a fair chance to produce recovery. The situation is quite like that in tuberculosis or typhoid fever. If the attack is sufficiently severe to unfit the patient for ordinary duties, treatment at home is probably inadvisable. Although in attacks all active psychotherapy, especially analysis of any kind, is merely harmful, yet the loss of relation between current experience and emotion is never absolute; temporary effects are possible by separation from worries and distressing associations, reassurance, kindness, and firmness. The essential combination of these, and especially the last, is rarely obtainable at home. Apart from custom, it would hardly ever be necessary in the first instance for cases of manic-depressive type, whatever their severity, to be treated under a detention order. Both the maniac and melancholic, however boisterous or suicidal, usually recognize their need of treatment. They may become intolerant of treatment or intolerable to other voluntary cases, but the practice of certification which has prevailed hitherto results on the one hand from a legal tradition which happily is now nearing death, and on the other from the lack of any place where poor cases can go for treatment apart from the unwilling and chronic.

Specific treatments designed to cut short attacks are many, but their effects unproven. The largest claims have been made for detoxication—that is, removal or disinfection of the foci already mentioned, together with vaccine therapy. Such measures should doubtless be adopted where any obvious physical indications exist, but rarely for mental symptoms in the absence of these, and always with due regard to risks. I have seen a large number of acute mental attacks and exacerbations clearly following extensive dental extraction; it is often difficult to decide in particular cases whether emotional stress or sudden toxaemia is the cause.

The effect of malaria in general paralysis and the way in which intercurrent disease sometimes aborts manic-depressive attacks has led to induction of artificial pyrexia in the latter with various substances. So far results are not definite, but I think the method might be worth further trial, especially in melancholics tending to become chronic. The results of intensive thyroid treatment have been disappointing in my experience.

In the main, treatment of attacks is hygienic. A patient with serious emotional disturbance should be kept in bed as in the case of a feverish tuberculous patient; open air and sunlight are nearly as important in manic-depressive psychosis, and massage is a useful substitute for exercise.

Feeding is the second main essential, and the supply of all vitamins should be adequate. Patients must take sufficient food, and when they are losing weight tube feeding should not be delayed even if only needed as a supplement. It renders possible gastric lavage, which is useful in many cases with atonic dyspepsia, and also the administration of aperients and sedatives without a struggle. Sleep by night and cessation of motor restlessness by day must be obtained. As to hypnotics, I believe, with Sir Maurice Craig, that we take too seriously the danger of habit formation, and too lightly the damage wrought by insomnia. Some success has been claimed for the attempt to cut short manic-depressive phases by induction of twilight sleep for a week with somnifen. I have no experience of its use quite early in an attack; later I have seen it fail a good many times. Use of sedatives as "chemical restraint" during the day is an unfortunate necessity. It is certain that in some cases they are better for the patient than incessant restlessness; their use in practice cannot be avoided for the sake of other patients. If the interests of the latter and of the staff are not allowed to outweigh those of the patient there is no abuse. Most experienced persons would admit that, subject to the same proviso, there are cases where seclusion and even mechanical restraint would be preferable, but in the case of the latter at least the risk of abuse is so great that its practical abolition is best on the whole. Hyoscine has achieved a quite undeserved ill fame; it seems to me indispensable in many cases. Sulphonal and similar drugs, which have been described as specific for mania, seem to me far the worst of the sedatives, to be used only with every precaution to avoid accumulation and avoided if possible in recent cases. They may be the only drugs that will quiet the intolerable chronic maniac, but of their deteriorating effect in some cases there can be no doubt. Prolonged baths are a useful adjunct in some cases, both to procure sleep and check motor restlessness. Often they need using in conjunction with a preliminary sedative, and will then reduce the use of drugs.

Prevention of injury to self and others is the last point in connexion with treatment of the acute attack. We are losing faith in mechanical precautions and in everything but knowledge of patients and observation. Even this should be unostentatious; the excellent principle of "safety first" can be overworked. Two good rules are to discredit the maxim that those who talk of suicide never commit it, and to remember that most suicides are surprises, often by the convalescent.

I can only just touch upon the question of treatment in those degrees of manic-depressive psychosis (in the broad sense) which are susceptible to psychotherapy. I disbelieve in all theories which single out special patients within this wide group as permanently fitted or unfitted for such treatment. Most are suitable at some time, some never pass the limit which disqualifies them. In tuberculosis it is not different varieties of the disease but varying degrees of activity that necessitate treatment by rest or exercise; the position is similar in emotional disturbances, but at present the indications are more obscure.

Practical treatment habitually ignores theoretical distinctions between suggestion, persuasion, and analysis, and utilizes a compound in which they are inextricably combined. Tracing the devious origin of symptoms and presenting them in a new light for review is often helpful, but some have exaggerated the degree to which repressed complexes are primarily responsible and benefit follows mere elucidation, while others overestimate the extent to which any analysis, however prolonged, achieves lasting reconstruction of temperament. Great practical benefits are obtainable by psychotherapy in emotional disturbances, but they generally seem to depend on getting the confidence of the patient and using this to influence superadded hysterical symptoms and various tendencies to shirk difficulties which the essential temperament multiplies and magnifies.

I hope I shall not be dubbed pessimistic if I express some doubt of the ability of psychotherapy to cure radically, in a large proportion of these cases, the lasting tendency to undue emotion of some type and to phases of reduced efficiency. There is quite a proportion of cases in which one should insist that minor attacks of depression and anxiety must be courageously ignored by some patients, as physical pain by others, or prevented from influencing conduct. The most spectacular effects in psychotherapy are of course achieved by those who believe in their powers to effect radical cures. It is doubtful whether equal good is not done in the long run by patient people who realize that some of these depressives are permanently inadequate in one way as the feeble-minded in another, and who recognize that many need sheltered conditions with occasional guidance, support, and control. Treatment often consists of the intelligent provision of these at the right time, and fortunately the results are at least equal to those achieved in any chronic disease.

in general and melancholia; for example, the former had frequently a brief episodic appearance; and they had often an immediate and complete dependence on external circumstances in a way unknown in "true melancholics." Who had heard of a melancholic of the manic-depressive type who was well and at ease while he sat in the garden, but was plunged in misery when he returned to the drawing-room? Dr. Gillespie had at the present time a patient with such an anxiety state.

Dr. Mapother had rightly described "sorrowful memories in melancholics"; he thus touched unwittingly on another distinction from psychoneurotics. In the latter it was precisely that the troublesome ideas were not sorrowful, and the problem before the physician was to discover why ideas apparently colourless in themselves should be so distressing. That the enduring character of the hysteric was the "persistent analogue" of the mixed manic-depressive was a statement that must also be challenged in the interest of clearness. If true manic and melancholic ailments were common in hysterics it would be expected to find both of two things: First, that hysteria was common in the anamnesis of manic-depressives. The general impression was that it was not. In the last twenty-one depressives he had treated and investigated extensively, only two had any symptoms that appeared hysterical, and one of these was a very problematical case. Secondly, they would expect to find a manic-depressive history commonly in hysteria; in his last thirty cases of hysteria Dr. Gillespie had not found one such.

The "useless exercise of making a diagnosis between functional neuroses and psychoses" would not be saved by the discovery *post mortem* of a patho-physiological basis for each of them. Further, the distinction between neuroses and psychoses rested not upon the problem of certification so much as upon the problem of treatment. The treatment that was suitable for a manic-depressive was fatal to a psychoneurotic, as Dr. Gillespie knew to his cost. He had not tried the converse process—the application of the methods for psychoneurotics to psychotics; but he had met the results of such an application and they had been among the most seriously ill patients he had seen. Blood pressure showed little or no correlation with mood, and very little with behaviour in mental patients. The changes in the cortex in dementia praecox described by the late Sir Frederick Mott awaited confirmation. The best controlled work on the subject (that of Dunlap) had in fact shown no cortical changes.

The task of psychopathology at present was not so much the discovery of a physical basis—that was not psychopathology, and smacked of the pseudo-physiologizing of the latter half of the last century which Meyer had well designated "brain-mythology"—but the unravelling of the meaning and origin of mental symptoms as such. That there was a "phasic state of susceptibility" in manic-depressive illnesses seemed not by any means proven. Statistics from the New York State hospitals showed that of about 12,000 manic-depressive cases, only 50 per cent. had a second attack, and only 25 per cent. had a third.

It was to be regretted that Dr. Mapother had made no mention of MacCurdy's work on the manic-depressive psychosis. Whether MacCurdy's views were accepted or not, his case material was clinically the best that had been published in this country on this topic. His work did much to upset what might be called the "psychiatrist's fallacy"—that thought always followed emotion. Emotion probably more often followed thought. The poets recognized this, if many psychiatrists did not—"My heart leaps up when I behold a rainbow in the sky." It seemed to the speaker that it might be more helpful to speak of "primarily affective disorders" and to subdivide them as follows: (1) manic-depressive disorders; (2) reactive mood-disorders (depression usually); (3) affective episodes in psychopathic personalities; (4) psychoneurotic mood-disorders; and (5) miscellaneous group. In this or some similar way a heterogeneous mass of material could be subdivided, the conception of the manic-depressive psychosis clarified, and all of the manifestly affective reaction types better understood.

Dr. R. H. COLE (London) believed that everyone was liable to manic-depressive reactions of a mild type and that manic-depressive psychosis was merely an exaggeration of this state. It was doubtful, however, if sufficient evidence existed for saying that a psychoneurosis could become a definite psychosis.

Dr. MAPOTHER, in reply, said that discussion had centred almost entirely around the relation between the neuroses and psychoses. There had been some distortion of the views expressed in the paper, doubtless due to lack of time to consider it. Dr. Ross had suggested that it made light of the need to estimate the risk of suicide. On the contrary, this need was specially mentioned under diagnosis. It would be begging the question at issue to assume that the need was best met by labelling the patient. Two speakers had detached from their setting the words that details of the mental state were unreliable as a basis for exclusion of organic disease and had ascribed to him the general view that investigation of such details was unnecessary in dealing with neuroses and psychoses. The real fact was that he took a wider view of the usefulness of such investigation than those who believed in two distinguishable syndromes—one due to mental causes and capable of mental cure, the other with a course quite independent of such causes and treatment. As Dr. Ross had raised the question of personal experience, he might say that he spent most of three years in various hospitals dealing with the war neuroses, and for the past three had been connected with the only hospital in this country where it was possible to get simultaneous experience of both extremes in mental disorder and of the intermediate cases that were the crux of this question. He could only express surprise when Dr. Gillespie and Dr. Gordon doubted the occurrence of cases that were at first indistinguishable from manic-depressive psychosis and ended as dementia praecox. He thought most of those with considerable experience as medical officers of a mental hospital would have seen such cases. Most of the speakers seemed still to adhere to the limited idea of manic-depressive psychosis as occurring entirely in clear-cut spontaneous phases. Dr. Gillespie's remarks regarding treatment probably ignored the fact that what he found so disastrous was only recommended for phases where the patient was inaccessible to psychotherapy. He did not question the ability of Dr. Ross to foretell correctly the chances of suicide and certification in a large proportion of cases, especially if they were mostly chronic. Whatever the exact form of symptoms there was a tendency in some cases to occurrence in acute attacks, in others to minor attacks or chronically; after years, of course, probabilities could be estimated. He thought that Dr. Ross consciously or unconsciously considered known course as well as form in making a diagnosis. The test would be his ability to forecast the course from the form just after the first beginnings of symptoms in the patient.

SECTION OF ANAESTHETICS.

SAMUEL JOHNSTON, M.D., President.

DISCUSSION ON ANAESTHESIA IN RELATION TO CARDIO-VASCULAR AFFECTIONS.

OPENING PAPER

BY

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IN the course of my professional work I am sometimes asked to give an opinion regarding the risk of inducing anaesthesia, for the purpose of an operation, in those who are the subjects of some cardio-vascular affection, and also, in a certain proportion of these, which is the safest anaesthetic to administer. I frankly confess that this is one of the responsibilities which I least like undertaking. The decision is often one attended with great difficulty, and in this connexion, at the outset of my remarks, I desire to

said was a common one—namely, remorse. He thought it might be said that this was a very great diagnostic symptom. No patient suffering from a psychoneurosis complained of remorse. If a patient suffered from this he was certainly in the depressive group, and one could not promise him immunity from loss of liberty. It should be understood that he was talking of a patient before he had had any sort of analysis; an analysis might reveal something which called for remorse. But while the psychotic-depressive on the whole tended to blame himself for his state, the psychoneurotic always blamed someone else, if, indeed, he was not praising himself in showing that his illness had been due to overwork and self-sacrifice. Here, then, a very striking difference was perceived in mental reaction between the two groups. This question of overwork led to a second point in diagnosis, for although the psychoneurotic often spoke of overwork, a critical estimation of what was actually done did not make the physician feel that the amount accomplished had really been great; the psychoneurotic did not do anything so foolish as to overwork himself at any time of his life. But a well authenticated history of overwork was often obtained in the case of a manic-depressive. He would not care to assert that the overwork was the cause of the breakdown; it might equally be true that it was a symptom of a mild manic phase when the patient thought that he was invulnerable. This led them to consider history a little more, and when this was done it would be found that the story of the intervals between the attacks was different in the two conditions: the psychoneurotic was never in quite good health; when he was well he was "highly strung" or dyspeptic, and was often consulting a doctor; the depressive when he was well was really quite well. He did not think that the opener had emphasized sufficiently the importance of history; in the diagnosis from organic disease Dr. Mapother said there were only two requisites—namely, complete examination and a sound knowledge of neurology. Dr. Ross thought history would be found more important even than examination, and the fact that Dr. Mapother emphasized neurology, and not cardiology, gastrology, proctology, and all the other ologies of the body, made the speaker suspect that it was only a very small section of the psychoneurotic group that found its way to the Maudsley Hospital. He thought that if Dr. Mapother had seen a number of people whom he could not be sure about—for example, whether they were suffering from a psychoneurosis or from cancer of the stomach—he would be more willing to admit that there was really a difference between the former and the psychoses. There was a great difference in reaction to mental environment between the two conditions. If the psychoneurotic was in an environment where he was perfectly happy, he was better for the time being. This environment might be provided in many ways: an attentive doctor, an interesting treatment, a holiday with congenial companions might provide it. Such things usually had no effect on the psychotic, and if they had, it was never in so striking a manner. Equally, displeasure at once cast the psychoneurotic down, and affected the psychotic very little. In nothing was this shown better than when an attempt was made to give aesthetic pleasure. The psychoneurotic who looked on a beautiful garden obtained as much pleasure out of it as anyone else; the psychotic said he could see it was beautiful, but he could not feel it.

These, then, were some important differences; and if he had shown that the exercises were not wholly useless, had they any value in treatment? His answer was that appropriate treatment could not be undertaken in the absence of such a diagnosis. The psychoneurotic was capable of enormous improvement if his mental orientation was altered, and the physician could alter it by the various forms of psychotherapy in the large proportion of cases. The manic-depressive psychosis was a disease which ran a course; the physician had little power to make any striking alteration in orientation. He could take care of his patient, and thus indirectly could hasten, perhaps, recovery, but active therapy was out of the question. Dr. Ross therefore absolutely controverted Dr. Mapother's view that the two states showed no difference in reaction to treatment.

Dr. R. D. Gillespie (London) considered that a definition of "manic-depressive psychosis" was certainly desirable, since there had been an inclination to give the term an application so wide that its meaning had become vague and its value doubtful. Before dealing with Dr. Mapother's definition, he wished to draw attention to the opener's preliminary remark, that the primary problem was what meaning should be attached to the term "manic-depressive psychosis," and that there was no constant and specific cause and no physical modification recognizable. The failure to mention clinical criteria Dr. Gillespie would have regarded as an accident, were it not for the remark later in the paper that details of mental states were utterly unreliable. This tendency, more or less unconscious, to depreciate clinical differentiation gave the key to Dr. Mapother's subsequent surprising classification of all psychoneuroses as a subdivision of the manic-depressive psychosis. In his definition the depressive phase was characterized as showing a "morbid dissatisfaction with the self or circumstances." That Dr. Mapother did not really consider this to be a good characterization was shown by his subsequent remark that in a surprising number of even the severest cases of melancholia there was a "formless" sense of one of the types of distress mentioned. This was precisely the point. The feeling that was called depressive in these patients was often "formless"—there might be neither "morbid dissatisfaction" nor "dissatisfaction with the self or circumstances," but only something vague and very unpleasant in tone. From this arose the difficulty that these patients so frequently had in expressing their condition to the physician. In the definition of the manic phase "misdirection" of activity should surely have been "continuous change of direction"; otherwise the definition could have applied almost to a full-blown paranoia. The truth was that the manic-depressive psychosis was essentially a clinical conception, and that an attempt to define something that had been differentiated on purely clinical grounds in terms of academic psychology after McDougall was likely to fail. It seemed probable that cases beginning as "pure manic-depressive psychoses" and ending as dementia praecox became very much fewer as more attention was paid to clinical differentiation. That was not the only type of dementia which occurred. Kraepelin himself recognized a tendency to dementia, not schizophrenic in nature, after repeated attacks. That there was a "continuous graded series" between the neuroses (or rather the psychoneuroses) and the manic-depressive psychoses was not a conviction that was generally held. If the question of the interrelationships of the psychoneuroses and manic-depressive disorders was placed on a broad biological basis very great differences were found, according to members of Kraepelin's own school, such as Lange and Cimbal. (1) The heredity of manic-depressive disorders was a similar one; while in the heredity of psychoneurotics occurred schizophrenia, epilepsy, and psychopathic states. (2) The type of pre-morbid personality was different in the two groups. (3) The physical types, if Kretschmer's work was accepted, were different in the two groups. The value of Kretschmer's work on physique and character, although widely confirmed on the Continent, was, of course, still *sub judice*. Certainly among sixty successive psychoneurotics recently seen by the speaker there was not one of the classical "pyknic" type. (4) The somatic morbidity was different in the anamnesis of the two groups. (5) The physical disturbances actually accompanying the mental conditions differed in kind as well as in quantity in one group as compared with the other.

That "obsessions were common in melancholics" was an original observation which he would have liked to see expanded. By "anxiety neurosis" it was presumably intended to designate also "anxiety hysteria," since here Dr. Mapother referred explicitly to Freud. When it was said that "anxiety neurosis" merged by a continuous series of gradations into agitated melancholia, presumably not melancholia agitata, which might have no anxiety, but anxiety melancholia was intended. Here it seemed to the speaker, on the contrary, that something entirely discontinuous was introduced—namely, the melancholia. There were numerous clinical differences between anxiety states

In the great majority of cases a correct diagnosis of the existence of extra-systoles can be made simply by palpation and auscultation, especially the latter. The normal rhythm of the heart is disturbed by the occurrence of a premature beat, followed by an abnormally long pause. The auscultatory signs are of great diagnostic value. I shall refer to the differential diagnosis between extra-systoles and partial heart-block in a moment. It is sometimes very difficult, if not impossible, to distinguish by palpation and auscultation alone between extra-systoles occurring frequently and at irregular intervals, especially if of auricular origin, and auricular fibrillation; but in such cases a sphygmographic tracing is almost invariably sufficient.

There are three degrees of auriculo-ventricular block: (*a*) There may be merely a prolongation of the interval which separates the commencement of the contraction of the auricle and that of the ventricle, each stimulus of the auricle reaching the ventricle, which duly responds. (*b*) The stimulus does not always reach the ventricle—in other words, the ventricle does not always respond to the stimulus from the auricle. (*c*) A condition in which no impulses reach the ventricle from the auricle, so that the auricle and ventricle beat independently of each other. The first two of these are referred to as "partial heart-block," and the third as "complete heart-block." The first grade can only be recognized by means of the polygraph or the electro-cardiograph. The second degree of heart-block may give rise to intermission of the pulse, pulsus bigeminus, pulsus trigeminus, and infrequency, including halving, of the pulse rate. Extra-systoles or partial heart-block account for the vast majority of such cases.

The differential diagnosis between these conditions, due on the one hand to extra-systoles and on the other to partial heart-block, can be readily made, as a rule, by means of palpation and auscultation. In the former case a premature beat can be detected at the apex-beat, and on auscultation one or two heart sounds will, in the great majority of cases, be audible during the early part of the pause, because the ventricle has contracted; whereas, in the case of partial heart-block, there will be an absence of an apex-thrust and of heart sounds during the pause, because the ventricle has failed to contract. In complete heart-block the pulse rate is usually not more than 36, though some cases have been recorded in which the rate has been even up to 60 or more a minute. It is sometimes difficult to distinguish between partial and complete heart-block without the aid of the polygraph or electro-cardiograph. Most cases with a ventricular rate of 36 or under, however, are cases of complete heart-block. When bradycardia is due to complete heart-block the ventricular rate is not increased by posture, physical exertion, emotion, or pyrexia.

A lesion of either the right or left main branch of the auriculo-ventricular bundle, and what is called intra-ventricular block (a condition in which there is abnormal conductivity of the subendothelial arborizations of the auriculo-ventricular bundle), can be diagnosed by the electro-cardiograph alone.

By pulsus alternans is meant a condition of the pulse in which, while the rhythm is perfectly regular, a large beat and a small beat alternate. In the vast majority of cases it is necessary to take a tracing of the radial artery in order to recognize the condition. It is of the utmost practical importance that the variety of irregular action of the heart indicative of auricular fibrillation should be recognized. This type of irregularity presents the following features: (*a*) It is continuous. (*b*) The irregularity is complete; the rhythm is irregularly irregular. In a sphygmogram it will be found that two beats of the same length or amplitude rarely follow each other. There is often no relation also between the length of a pause and the amplitude of the beat which follows it—that is, a short pause may be followed by a strong beat, and a long pause by a weak beat. We may be reasonably certain of the existence of auricular fibrillation from the mere presence of complete irregularity of the pulse. It is possible to determine complete irregularity of the pulse in a large proportion of cases by palpation and auscultation alone. When, however, the ventricular rate is slow, or very rapid, the irregularity may be only slight, and it may be necessary to adopt careful measurements of the sphygmogram to detect it. It is necessary to exclude irregular action of the heart due to extra-systoles or to auricular flutter. In most cases of auricular flutter the rhythm of the arterial pulse is regular. Not infrequently, however, there is irregularity of the pulse rhythm, it may be even markedly so, and in some of these cases a sphygmogram may resemble that of auricular fibrillation. In this connexion, if a sphygmogram from a case of auricular flutter be carefully studied, it will be found that even if the ventricular rhythm is markedly irregular the pulse beats measure out into groups of equal length, whereas this is never the case in auricular fibrillation.

Paroxysmal Tachycardia.

By paroxysmal tachycardia is meant a condition in which a marked acceleration of the cardiac rate occurs, which commences suddenly and abruptly and without apparent cause, lasts for a varying period, ceases suddenly and abruptly, and is due to an abnormal rhythm—the stimulus for cardiac contraction, instead of arising at the junction of the great veins with the auricle, having its origin at an abnormal point. A diagnosis of paroxysmal tachycardia is usually possible without having resort to instrumental methods. Thus: (1) The suddenness and abruptness of the onset and termination of the tachycardia is a characteristic feature—the maximum rate is attained within a few seconds, and the return of the cardiac rate to what it was prior to the attack occurs equally quickly; whereas in tachycardia associated with the normal rhythm the onset and termination are gradual. (2) A persistent rate of over 160 is almost invariably due to an abnormal rhythm. (3) With the exception of those cases due to transient attacks of auricular fibrillation, the cardiac rate is not influenced by posture, physical exertion, emotion, pressure upon the vagus, or pyrexia, as is the case in tachycardia associated with the normal rhythm.

What is the prognostic significance of the various types of irregular action of the heart *in themselves*—in other words, what practical bearing do they have upon the subject-matter of our discussion? Sinus irregularity may be entirely disregarded. The question of extra-systoles is of great practical importance; they constitute one of the most frequent causes of irregular action of the heart, and may give rise to very disagreeable symptoms. There is considerable diversity of opinion as to their prognostic significance. Further experience has not led me to change the opinion I expressed in 1911—namely, that there is so far no evidence for supposing that extra-systoles are either indicative of an impaired heart or that they add to the gravity of any existing morbid condition; so that with regard to the subject-matter of our discussion they may be disregarded. The occurrence of partial heart-block during the course of an acute infective disease is a sign, and may be the only sign, of myocardial involvement. Persistent heart-block of mild degree is also indicative of myocardial damage. The prognosis of bundle-branch block is usually very unfavourable. That of intraventricular block is almost always of grave import. From the point of view of the anaesthetist there are two kinds of pulsus alternans—namely, one in which the condition is associated with a severe grade of tachycardia, and the other in which it is not. In the former event it does not appear to have any serious significance in itself. In the latter, however, it is an indication of extreme exhaustion of the heart muscle, and should be regarded as an imperative call on the part of the heart for rest—complete and prolonged. Auricular fibrillation is in the vast majority of cases indicative of some myocardial change. Put briefly, the prognosis depends upon the ventricular rate, the degree of any existing cardiac failure, and the response to digitalis therapy. I shall refer to the last point later. With regard to the risk of inducing anaesthesia in an individual who is the subject of paroxysmal tachycardia, this depends chiefly upon (1) whether there is coexisting chronic myocardial or chronic valvular disease, and, if either be present, its nature and degree; (2) to a less extent, upon the average duration, the ventricular rate, and the degree

express most sincerely and warmly my great admiration for the courage and ability with which the anaesthetist faces and discharges his responsible and difficult task; and furthermore, I should like to bear my grateful testimony to much that I have learned from him, and—may I add?—from the surgeon also.

I feel considerable diffidence in addressing an audience of experts, such as this is, on this important subject. I can even understand it being stated that the cardiologist is seldom, if ever, able to render much practical help, and yet I venture to hope that it is possible for him to furnish something of value to the common stock of useful information on the subject.

As far as my experience and observation go, speaking generally—that is, taking cases as a whole—given adequate knowledge and skill and care, the subjects of cardio-vascular affections stand the induction of anaesthesia surprisingly well. Indeed, it has even been stated that if a person is able to undergo an operation it will not be impossible for him to stand an anaesthetic. It may be added that if a fatality should occur during the induction of anaesthesia in the subject of a cardio-vascular affection it may have been due to the choice of the wrong anaesthetic or the manner in which the anaesthetic was given. But, unfortunately, painful surprises do sometimes occur in the experience of even the most skilled anaesthetists. As I shall show you later, these are usually cases of unrecognized chronic myocardial disease. How to avoid so unfortunate an event is the main purpose of my remarks this morning.

Reduced to simple terms, an operation means, in essence, an added piece of work—an added load—of varying degree, depending upon the nature and duration of the operation, to an impaired heart, or an impairment of some other part of the cardio-vascular system. The fundamental question which has to be decided is whether the various parts of the cardio-vascular system can stand this. If this is doubtful it is a case of comparing this risk with the degree of urgency of the operation proposed. Questions of diagnosis, prognosis, and, it may be, treatment, are involved; and prognosis depends largely, if not almost entirely, upon accurate diagnosis.

It is generally recognized that within recent years there has been a great advance in our knowledge of cardiac disorders, and that this advance has been of vital importance with regard to diagnosis, prognosis, and treatment. I would plead the great advantage of a closer acquaintance, of a practical kind, on your part, with this advance. It is true that this progress has been mainly the result of the employment of the clinical polygraph and the electro-cardiograph. Let me, however, encourage you by pointing out that, the work of elucidation having been accomplished, it is not now necessary to employ either the clinical polygraph or the electro-cardiograph in the great majority of cases, the use of a sphygmograph being sufficient, and in a large proportion palpation and auscultation are all that is necessary.

It is obviously impossible, in the time at my disposal, to deal with the whole subject of the cardio-vascular system from the point of view of the induction of anaesthesia. I shall content myself by making some practical observations with regard to some of the more important points.

Passing to the clinical examination of the heart, I would emphasize that the rate and rhythm of the heart should always be determined at the cardiac apex, either by palpation or auscultation, preferably the latter—for two reasons: (1) the rate of the radial pulse does not necessarily represent the ventricular rate; and (2) in order to determine the type of irregularity, which is of great practical importance.

Rate of the Heart.

It should be remembered that the normal cardiac rate has a considerable range of variation in perfectly healthy individuals. Also I need scarcely remind you that tachycardia may be due to the excitement incidental to a medical examination. May I point out that by the term "bradycardia" is meant infrequent action of the *heart*, and that it must be distinguished from infrequency of the *pulse rate* at the wrist? Bradycardia also may be physiological, especially in males. It is difficult, therefore, to decide when tachycardia or bradycardia in an individual is pathological. In both cases a record of the past history is of value. It is scarcely necessary to observe that there are many causes of the pathological form of tachycardia and bradycardia other than the various kinds of heart disease. The increase in the cardiac rate induced by physical exertion varies in healthy individuals. It is, therefore, difficult here also to determine whether an increase in rate is pathological. In this connexion, the presence or otherwise of accompanying subjective symptoms of cardiac distress is of fundamental importance. Other causes of an abnormal increase of the cardiac rate on physical exertion than cardiac disease proper, such as atony of the wall of the heart muscle the result of lack of physical exercise, and poisoning of the heart without structural damage, should not be forgotten. The time which may elapse before the cardiac rate returns to its former level after physical exertion is of greater significance than the degree of increase induced by the exertion.

Irregular Action of the Heart.

Irregular action of the heart is of great practical importance in regard to the subject-matter of our discussion. I mean irregular action *in itself*—that is, without reference to the cause or the condition with which it may be associated—and my remarks shall be used in this sense only. Formerly, this subject was a source of great perplexity and difficulty to the clinician. It was known that irregular action of the heart in itself might, on the one hand, be of even serious significance, or, on the other hand, that it might be of no practical importance at all. It was not possible, however, to determine the significance of the irregularity in any given case. We are now able to classify almost every case of irregular action of the heart into types, and we know what each type signifies; and, most fortunately, it is possible to determine the type by palpation and auscultation alone in the great majority of cases, and, in case of doubt, by the use of a sphygmograph in the vast majority of cases.

All cases of cardiac irregularity, apart from comparatively rare exceptions, fall into one of six groups: (1) What is called sinus irregularity; (2) irregularity due to premature contraction or extra-systole; (3) irregularity due to heart-block; (4) irregularity due to pulsus alternans; (5) irregularity due to auricular fibrillation; and (6) irregularity due to auricular flutter.

In sinus irregularity there is a variation in the length of the diastolic period of the cardiac cycle, while the systolic period remains constant, and this can be detected by the stethoscope. If a tracing of the radial artery be taken, the intervals between the beats will be found to vary, but the actual variations are not numerous, while the pulse beats are of equal, or nearly equal, size. When irregularity of the cardiac action is found to be definitely related to respiration it is in all probability of the sinus type.

By extra-systole is meant a premature contraction of the auricle, or of the ventricle, or of both chambers together, while the fundamental or sinus rhythm is otherwise maintained in most cases. Usually the extra-systole is followed by a long pause—the *compensatory pause*. On auscultation, in the vast majority of cases, two heart sounds are synchronous with each cardiac cycle; sometimes only the first sound; very rarely is there an absence of both sounds. Extra-systoles may appear at long or at frequent irregular intervals, or regularly after each normal beat, or after every second, or third, or more, normal beats, or in paroxysms. An extra-systole may be so feeble that no wave is felt at the wrist, so that there is simply an abnormally long pause, resulting in an "intermittent" pulse. If a single extra-systole, with its succeeding compensatory pause, occurs after every two normal beats, the pulse beats occur in threes, the condition being known as pulsus trigeminus; but if the premature contraction is so feeble that no wave reaches the wrist, the pulse beats are paired (pulsus bigeminus). If an extra-systole occurs regularly after each normal beat and the extra-systole fails to reach the wrist on each occasion, the rate of the arterial pulse is halved.

symptoms are giddiness, syncope or fainting attacks, attacks resembling *petit mal*, and Adams-Stokes syndrome. While giddiness and syncope may occur in heart disease, they are frequently due to vasomotor derangement, in which connexion it is of fundamental diagnostic importance whether they are more associated with physical exertion or change of posture. What is called cardiac asthma may occur.

It has occurred to me that it might be helpful to you if I indicated what, speaking broadly, may be regarded as clinical manifestations of four degrees of cardiac failure—namely, slight, moderate, severe, and extreme. *Slight:* Shortness of breath, palpitation, exhaustion, and, it may be, precordial pain, on exertion which the patient formerly could undergo without experiencing this. *Moderate:* Shortness of breath, palpitation, and, it may be, cyanosis, on moderate exertion, such as walking quickly on the level; puffiness round the ankles in the evening; some degree of increased rapidity of the pulse while at rest; slight enlargement of the liver. *Severe:* Shortness of breath on slight exertion, such as walking at the ordinary rate on the level, or on changing position in bed; cyanosis while at rest; a considerable degree of oedema of the lower extremities in mitral cases, and a moderate degree in uncomplicated aortic cases; a considerable degree of tachycardia while at rest; oedema of the bases; a moderate degree of hepatic enlargement; albuminuria; orthopnoea; cardiac asthma. *Extreme:* Continuous shortness of breath; severe dyspnoea on slight exertion; marked cyanosis while at rest; general anasarca in mitral cases, and a considerable amount of oedema of the lower extremities in uncomplicated aortic cases; oedema of the serous membranes; much hepatic enlargement; pulsus alternans in the absence of a severe grade of tachycardia. A point of the utmost prognostic importance in angina pectoris is the ease with which the pain is provoked, and whether it occurs even when the patient is at rest.

I now pass to some therapeutic considerations. These are germane to the purpose of our discussion, for the following reasons: I am strongly of opinion, and would with great earnestness submit it for your consideration, that not infrequently fatalities occur during the induction of anaesthesia which might be avoided if advantage were taken of certain therapeutic measures which are clearly indicated. I am bound to say that I have been much impressed with the frequent lack of due preparation shown, as far as the heart is concerned, in the case of operations on the subjects of cardio-vascular affections. May I give you some examples of this? Most unfortunately a considerable proportion of patients with cardio-vascular affections endeavour, or are compelled, to live beyond the limit of the heart's strength, with the result that their hearts are constantly tired. I have merely to mention the inadvisability of operating on the subject of a cardio-vascular affection at a time when the heart is exhausted, and of the importance of postponing the operation until the patient has had a period of rest adequate for a full restoration to the normal level of cardiac strength whenever possible. Again, in the cardiac failure due to a rapid ventricular rate associated with auricular fibrillation or auricular flutter, the results of the administration of digitalis in the majority of cases are very, and in some cases extraordinarily, good. This usually occurs within a week, and sometimes in three or four days, after the commencement of full doses; if the case is more urgent, a physiological effect is usually obtained in from twelve to thirty-six hours from the oral administration of massive doses; while in still more urgent cases, or when the patient cannot tolerate any of the other preparations of the digitalis series of drugs by the mouth, improvement commences within about two hours and becomes very pronounced six to ten hours later after an intravenous injection of strophanthin. In paroxysmal tachycardia 5 grains of quinidine sulphate once daily in the intervals between the attacks is usually successful in preventing their occurrence. In Adams-Stokes syndrome due to complete heart-block 5 to 15 minims of a 1 in 1,000 solution of adrenaline hydrochloride is often completely successful. Lastly, I would remind you of the value of venesection in certain cases of supernormal blood pressure, for while its effects are usually transient they are of sufficient duration for the purpose of an operation. I would, therefore, earnestly plead the importance of taking full advantage of modern cardiological therapeutic measures whenever possible.

The question of the choice of anaesthetic does not lie strictly within my province, and in any case experts such as you are more competent to deal with it. I would, however, ask leave to make a few observations. The symptoms of cardiac failure in mitral disease are principally respiratory in character. The symptoms of cardiac failure in aortic disease are at first usually mainly those of systemic anaemia, there being little or no chronic venous congestion. The chief danger is syncope, and it is important to avoid lowering the blood pressure. Later on symptoms of relative mitral incompetence are apt to appear. Syncopal attacks are also the chief danger in fatty degeneration of the myocardium, and the blood pressure is almost always low in this affection. In fibroid degeneration of the myocardium, while there is also a danger of syncope, the clinical picture approaches more that of chronic venous congestion, and the blood pressure is usually normal or above the normal. In subnormal blood pressure the obvious indication is at least to avoid a further lowering; whereas the opposite is the case in supernormal blood pressure, arterial disease, and aneurysm. In angina pectoris it is of especial importance to avoid an increase in the blood pressure, unless this is materially below the normal. In auricular fibrillation it depends upon whether the symptoms of cardiac failure are mainly respiratory in character, or mainly those of systemic anaemia; they are usually the former.

With regard to the use of chloroform: Deep chloroform anaesthesia may induce heart-block in animals, which suggests that pre-existing mild heart-block in man may be increased by chloroform. I would also emphasize the great importance of avoiding irregular or intermittent administration during induction, and light anaesthesia; not commencing the operation before the patient is completely under; and the patient should be allowed to come out of the anaesthetic quietly.

Lastly, the foregoing considerations apply to the cardio-vascular affections *in themselves*. I am well aware that other considerations, such as the age of the patient, whether he is of a robust or asthenic type, whether he is of a nervous disposition or not, whether he is addicted to excess of alcohol, and the nature and duration of the operation, have almost always to be taken into account.

I venture to hope that, if the observations I have had the privilege of making to you are put into practice there will be fewer fatalities, and also that it will be possible to perform operations which are indicated on surgical grounds but which otherwise it would not be possible to undertake.

II.—JOSEPH BLOMFIELD, *O.B.E.*, M.D.,

Senior Anaesthetist and Lecturer on Anaesthetics, St. George's Hospital.

Looking back on some twenty-eight years' experience as an anaesthetist and reflecting on the occasions on which cardio-vascular affections have played a part in the case which was being dealt with, two facts become prominent. The first is the number of times that patients have been encountered who had been told by medical practitioners that they "could not stand an anaesthetic on account of the heart," and the second is the minute space occupied by chronic valvular disease of the heart in any list that could be compiled of anaesthetic fatalities gathered from private and hospital work, both personal and that of colleagues. This is the more notable because there is scarcely a variety of chronic valvular disease which has not been present in one or other of the patients in such a series who have passed safely through anaesthesia and operation. Generally speaking, it can be truly said that patients with heart affections do not give difficulty to the anaesthetist, the reason no doubt being that with a poor circulation go a poor physique and feeble muscular development, and consequently a type of individual who passes easily into anaesthesia without undue spasm or excitement. Nevertheless, it would of course be foolish to underestimate the risk which may be introduced into a case by the presence

of cardiac failure during former attacks; and (3) the response to treatment—regarding which I shall say a word or two later on.

May I draw attention to the importance of examining the walls of other arteries than the radial, especially the brachial? How frequently is arterial disease excluded as the result merely of an examination of a short length of the radial artery alone! It is necessary to emphasize the great importance of accurately determining the size of the heart, more especially in cases in which the apex-beat is either faint or absent, and particularly in suspected chronic myocardial disease. I have been surprised at the comparative frequency with which these cases are overlooked—due, in my opinion, to a lack of appreciation of the great importance of determining accurately the size of the heart, and also to a lack of knowledge of the size of the normal heart in persons of varying size and physique. In any doubtful case the size of the heart should be determined by means of *x* rays.

Much valuable information may often be afforded by the cardiac sounds and the cardiac cycle. Thus: The first sound may be short, sharp, and clear, and diminished in intensity when the contractile force of the ventricle is reduced from any cause. What is called the tick-tack heart-beat or foetal rhythm signifies a greatly impaired vitality, and is often of grave omen. What is termed the gallop rhythm indicates either a failing heart muscle or a bundle-branch block, or possibly intraventricular block, and is almost always of very unfavourable import.

During recent years it has become rather the fashion not to pay much attention to murmurs, especially to those which are systolic in time. This is, I think, largely due to misunderstanding. As far as I am aware the older masters of clinical medicine were not accustomed to form a prognosis from the mere presence of a murmur. The point of practical importance is, What is the *significance* of the murmur? Thus, it is not justifiable to make a diagnosis of aortic stenosis from the mere presence of a systolic murmur over the aortic area, or of organic disease of the mitral valve from the mere presence of a systolic bruit over the apex of the heart, additional evidence being required in both cases. In every case in which an adventitious sound is audible over the precordium, the patient should be examined in the standing posture and on lying down, before and after gentle exercise, and during the various phases of respiration. In every case in which an adventitious sound is audible we should carefully consider whether it is exocardial or endocardial in origin, and, if the former, whether the murmur is organic or functional.

Chronic Valvular Disease and Chronic Myocardial Disease.

There is a tendency also not to pay much attention to chronic valvular disease. Now there are two points for consideration with regard to chronic valvular disease: (1) a valvular defect is a mechanical impediment to the heart muscle in its work; and (2) there are, as a rule, along with the valvular lesion, coincident changes in the myocardium, the aorta, or coronary arteries. I shall emphasize the great importance of the latter in a few moments. But that does not mean that a valvular defect may not be of great importance *in itself*.

In attempting to form a prognosis in any given case of chronic valvular disease, the nature, the extent, and mode of origin of the lesion, the condition of the myocardium, the amount of any existing degree of cardiac failure, the existence of complications, and the risk of sudden death are among those which require consideration. Of four varieties of chronic valvular disease, I should place in order of gravity aortic incompetence, mitral stenosis, aortic stenosis, and mitral regurgitation. With regard to aortic stenosis, however, a qualification is necessary; for although when due to a previous attack of acute endocarditis the prognosis is better than that of mitral stenosis, when primary chronic endocarditis is responsible it is not so good. Among the points which may be of assistance in trying to form an estimate of the extent of the lesion are: how far the character of the pulse and the blood pressure are modified, the size of the heart, and whether the murmur merely accompanies or replaces the cardiac sound; and, in the case of aortic incompetence, the pulse pressure, and, in the case of mitral stenosis, the length of the presystolic murmur, and the presence and length of a diastolic murmur. Taking cases as a whole, when the lesion is due to a previous attack of acute endocarditis the prognosis is not so serious as when due to primary chronic endocarditis or to syphilis. With reference to the risk of the occurrence of sudden death in cardiac affections, a fatal issue in this way is most likely to occur in fatty or fibroid degeneration of the myocardium; it is also of not uncommon occurrence in angina pectoris; while of the valvular diseases it is most frequent in aortic incompetence, in which it is to be noted that sudden death may occur even when there are no indications of cardiac failure. Another cause of sudden death is complete and abrupt closure of the lumen of a coronary artery or one of its main branches. I shall deal with the myocardium and cardiac failure separately.

We now pass to the most important part of our subject. I have already remarked (1) that it is chronic myocardial disease, occurring *by itself*, which is so frequently missed, and (2) in the case of chronic valvular disease it is of the utmost importance that we should endeavour to ascertain whether the lesion which has invaded the valve has also affected the myocardium, the aorta, or coronary arteries. Now with regard to the investigation as to whether the myocardium is involved or not, and if so to what extent, I have referred to the significance of auriculo-ventricular block, branch-bundle lesion, intraventricular block, auricular fibrillation, auricular flutter, paroxysmal tachycardia, the size of the heart, and various modifications of the cardiac sounds and of the cardiac cycle. It remains to add and emphasize the extreme importance of ascertaining *how the heart responds to effort*; in other words, the amount of physical exertion in which the patient can indulge without experiencing symptoms of cardiac distress. I would urge that you should conduct a searching inquiry with regard to this in every case. In conducting this inquiry it is essential at the outset that three facts should be borne in mind. The first is that the natural standard of the heart's strength varies in individuals, each individual knowing the kind and amount of exertion in which he can *normally* indulge without producing symptoms of cardiac distress, and being aware when there is any departure from this, and to what extent. Our inquiry should aim at finding out whether the normal standard of a patient has decreased, and, if so, to what extent. The second fact which should be borne in mind is that symptoms of cardiac distress on exertion may be due to causes other than heart disease. Thirdly, the cardiac muscle may be merely temporarily exhausted, and this may occur whether the heart is diseased or not. But, provided extrinsic and temporary causes—such as anaemia, sleeplessness, temporary physical or mental strain, deficient tone due to lack of physical exercise—can be excluded, the fact of a departure from the normal standard of an individual, and its degree, may be taken as fairly indicative of the presence and degree of myocardial disease.

In the great majority of cases the first indications of heart failure are symptoms of cardiac distress on exertion, and it is only afterwards that objective signs—such as increased pulse rate, dilatation, or dropsy—appear. These symptoms occur as the result of less and less effort, until ultimately some or all of them are present, even during rest, and objective signs also become evident. The commonest symptoms are breathlessness, palpitation, fatigue, and precordial pain, on exertion. Breathlessness is perhaps the most important symptom of all. The most characteristic feature of pain due to heart disease is that it is brought on by exertion—though it should be noted that the pain may not come on until some hours after the exertion which has induced it. The site of the pain may be over any part of the precordial area. The pain of angina pectoris is felt most commonly in the retrosternal region, next most frequently across the front of the chest, and occasionally in the precordium, the epigastrium, or over a wide area of the back of the chest, and has a tendency to radiate in certain directions. Cerebral symptoms may be due to cardiac causes. Among these

of oxygen was played throughout. The patient caused no anxiety during operation, and made a good recovery. The pulse rate did not rise above 50 per minute during the administration; it was 36 before this began.

Irregularity of the pulse is often met with, and in the absence of other symptoms need give the anaesthetist no concern. Generally the irregularity in otherwise normal persons persists during anaesthesia. When the irregularity has the form of pulsus alternans, or when the irregularity is extreme, or when there is undue rapidity of the pulse, the anaesthetist must mistrust the cardiac condition, and a special examination by a cardiologist is necessary.

We may now consider the bearing of the blood pressure upon the use of anaesthetics. With regard to excessive pressure, it is remarkable how few accidents have been attributable to this condition. It is often the case that persons with a blood pressure much above the normal have to be subjected to operation before time can be taken to reduce the plethoric state. These people are precisely those who are most apt to pass through a time of violent spasm and breath-holding during the induction of anaesthesia; at this time the blood pressure is, of course, enormously raised, and everything favours the rupture of a blood vessel. This accident, however, is of the rarest occurrence, and a search through the literature, as well as through personal experience, brings to light only two cases of positive haemorrhage and one case of hemiplegia which could reasonably be attributed to the action of an anaesthetic in patients who were the subjects of abnormally high blood pressure. When the pressure is unduly low the danger is, of course, that a still further lowering, produced by shock during operation, may result in syncope. In extreme cases it is desirable, whenever circumstances admit, to raise the pressure by intravenous infusion, and by warmth before operation is undertaken. The use of warmed ether will generally then enable the anaesthetist to get any patient safely through operation; but these persons give great anxiety afterwards when the stimulation of the ether has passed off. It is with the people in the condition outlined above that the use of hypodermic injection of morphine before operation is particularly dangerous. In the subjects of abnormally high blood pressure, on the other hand, preliminary injections of morphine and of scopolamine are often of the greatest service.

In giving anaesthetics to patients suffering from aneurysm, as to those with unduly high blood pressure, the problem is how to induce anaesthesia with the least possible muscular excitement. It might seem that in these cases chloroform should always be chosen as producing so much less stimulating an effect on the circulation. It often happens, however, that nitrous oxide or ethyl chloride is preferred, followed by ether, because of their rapid induction. The patient must be regarded as a whole, and not simply as an example of aneurysm or of supernormal blood pressure. This general survey will often convince the anaesthetist that the safest mode of anaesthesia—that which is most quickly and most quietly effective, and therefore puts the least strain on the circulation—is just one which might often, *qua* circulatory system, be the least desirable. The newer anaesthetics, ethylene and propylene, appear to offer particular advantages in cardio-vascular conditions, for they can be used with large proportions of oxygen, and they do not give rise to great spasm. Experience, however, is as yet limited with these agents, and in the case of ethylene the appearance of irregularity with rapidity of pulse in several cases in which the heart has been normal make me chary of pronouncing as yet a very favourable opinion.

DISCUSSION.

Dr. ERNST VON DER PORTEN (Hamburg) said that the non-organic cardio-vascular diseases were of more interest to the anaesthetist than the muscle and valve diseases of the heart, which had often been called contraindications to general anaesthesia. The patient with a so-called organic disease of the heart was a bad risk patient in the wider sense of the word, but the degree and seriousness of his disease and his consequent danger from being anaesthetized could be estimated fairly exactly. On the other hand, the patient suffering from cardio-vascular symptoms without organic basis was usually treated with particular respect by the anaesthetist, who was always afraid of surprise symptoms of collapse. In such cases there were two points to be watched with special care: The patients should come to the anaesthetic room carefully prepared and calmed by adequate doses of morphine; and secondly, in these cases anaesthesia should be as light as possible. Patients with a Basedow goitre should never, for instance, be so far under as to abolish the corneal reflex in both eyes.

Dr. A. L. FLEMMING (Bristol) joined issue with Dr. Blomfield as regards the necessity for the anaesthetist diagnosing the heart lesion. He maintained that the anaesthetist should know what type of lesion he had to deal with, and should make the examination and diagnosis himself. It was of the utmost importance in cases of cardio-vascular disease that plenty of time should be given for induction to avoid spasm and consequent heart-strain.

Lady BERRY (London) said she rarely gave an anaesthetic in cardio-vascular cases without a physician's report; patients with tachycardia and even with cyanosis could be prepared by rest and digitalis. She never gave a preliminary dose of morphine and always gave atropine. Slow induction was very important. She always gave open ether, and had a strong objection to nitrous oxide and oxygen in goitre cases. She always used the Rochester method of open ether, and the result of her inquiries from patients was that the induction by this method did not seem long. She kept the anaesthesia as light as possible all the time, compatible with real surgical anaesthesia, and carefully followed the respiration throughout.

Dr. H. M. COHEN (Manchester) raised the question of the relative importance of the systolic and the diastolic pulse pressure.

Dr. J. C. BRAMWELL (Manchester) said that the pulse was the most important indication of a patient's condition both to the anaesthetist and to the cardiologist. Irregularity of pulse was merely an outward indication of more profound disturbance in the circulation and heart mechanism. Syncope on the whole was due to a disturbance of the vasomotor mechanism rather than to a primary disturbance in the heart, and, excluding aortic disease, Stokes-Adams syndrome, and fatty and fibroid degeneration of the heart muscle, it was rare to find syncope due to heart disease rather than to disturbance of the vasculomotor mechanism. Bradycardia was common in good athletes, and the pulse rate was often 50 or less. A man was a good athlete because he had bradycardia. If his pulse rate rose to 150 on exertion his recuperative power was as 3 to 2 compared with a rival whose normal heart beat was 75 increased to 150 on exertion. Pulsus alternans was of very grave significance when not associated with a rapid heart beat.

Dr. H. W. FEATHERSTONE (Birmingham) found that cases with extra-systoles went through ether anaesthesia well and in many cases the extra-systoles disappeared in the course of the anaesthesia. The choice of an anaesthetic was a responsibility in the case of a patient with a high blood pressure. Chloroform gave bad results; spinal anaesthesia was also undesirable.

Dr. H. P. FAIRLIE (Glasgow) stressed the importance of assessing the risk before giving anaesthetics. The bad risk patient gave less trouble on the table than afterwards. The anaesthetist in these cases should be guided by the physician.

Dr. S. R. WILSON (Manchester) advised co-operation between the physician and the anaesthetist, the choice of the anaesthetic to remain with the anaesthetist under the advice of the physician. Digitalization was useful, but he desired information as to the influence of morphine and atropine in cases of heart-block.

of chronic valvular disease. When what is called "compensation" has broken down and there is shortness of breath then the subject of chronic valvular disease, if he must undergo operation, offers perhaps as critical a risk as any the anaesthetist is asked to meet. Even in such cases, however, when an operation is urgently necessary and the surgeon wishes to perform it, the anaesthetist need, in my opinion, never refuse the risk. There is always some form of anaesthesia or analgesia which can meet the demands of the situation, and although the inhalation of an anaesthetic may not be possible with safety, it is rarely indeed that the requirements of the surgeon cannot be met either by a regional analgesia, by rectal infusion, or by some combination of hypodermic injection with a minimal inhalation of nitrous oxide and oxygen, supplemented possibly by a very small amount of ether. The anaesthetist is not expected or required to make a diagnosis between the various kinds of cardio-vascular affections. What is, however, expected of him is that, confronted with a patient who is affected in one of these ways, he will be able to give a confident opinion as to the propriety or not of administering an anaesthetic at all, and if one is permissible he must be able to decide what it should be, how it should be given, and also to give it with safety. For these purposes we may consider the chief symptoms exhibited by the class of patients with whom we are dealing, and how these symptoms affect the anaesthetist's decision and procedure.

The most important symptom in a cardio-vascular case, from the anaesthetist's point of view, is breathlessness. When the patient cannot lie in the ordinary supine position with one pillow beneath his head without becoming breathless, whatever the exact change within the circulation which causes this symptom, the anaesthetist has a dangerous case to handle. Exactly how to meet the circumstances must depend partly on the site and nature of the operation to be performed, but certain principles will have to be observed in any case. First, the patient must be given his anaesthetic in that position in which respiration is most easily carried on; and secondly, in the administration of the anaesthetic, either no air limitation must be practised, or else air must be substituted by a free supply of oxygen. The great danger in this class of case is the introduction of any asphyxial element into the administration. The avoidance of this entails the avoidance of all spasm during the early stages of narcosis, and it is here that the anaesthetist's skill will be most severely tested. It is the not infrequent appearance of spasm in the upper air passages during the early stage of "gas and oxygen" anaesthesia that makes this method not always applicable (as at first sight we would expect it to be) to the kind of patients who are now under consideration. So vital do I believe it to be to avoid spasm and anoxaemia in these people that I would rather give even pure chloroform, if I believed that a quiet narcosis without muscular excitement during induction could be obtained with it, than the "safe" nitrous oxide and oxygen, if from the patient's build and the configuration of his mouth and pharynx I believed that spasm would be sure to arise during the inhalation of the gases. Whatever anaesthetic is used, oxygen should be given with it if the operation is at all prolonged, and, of course, every means necessary must be employed to ensure a perfectly unobstructed oral air way throughout. In association with shortness of breath I should like to mention a simple test which is invaluable in estimating a patient's capacity to undergo general anaesthesia. Without being obviously breathless, if a patient cannot, after taking a deep inspiration, hold his breath for thirty seconds then that patient almost certainly has a heart muscle which is poor and likely to fail if exposed to severe strain by any operation and anaesthetic. The use of this simple test will often put the anaesthetist on the *qui vive* in cases of myocardial degeneration, in which the patient's general appearance and the character of the pulse might not have led him to suspect the presence of risk. Auscultation will in such a case perhaps confirm the suspicions aroused, the first sound of the heart being found short and high pitched, and weak, or having a tick-tack rhythm. In the presence of these signs and symptoms the anaesthetist will be well advised to avoid the use of chloroform and to include some ether in whatever inhalational method he adopts. Poor quality of the heart muscle is the bugbear of the anaesthetist, whether it is due to fatty change or to myocardial degeneration of another kind. For this reason very obese people are poor subjects for severe operation, and also those who have for long harboured some focus of septic infection. It is in cases of myocardial degeneration without marked symptoms that the anaesthetist needs the co-operation beforehand of the cardiologist.

Stress need not be laid here on the great advantage of always letting the anaesthetist examine the patient on a day previous to that of operation when circumstances permit. When he makes this examination on a patient with myocardial inefficiency he will discover the need for more accurate knowledge of the heart's condition, and this will be supplied to him by the heart specialist with his electro-cardiograms. In cases of advanced degeneration, when there is dilatation of the heart and swelling of the ankles, help is not so necessary, because the condition is obvious; but this is not so in the early stages of degeneration, when the anaesthetist may detect nothing but a small feeble pulse, and an altered first sound. When the anaesthetist has the opportunity of testing the effect of exercise on the cardiac rate he is greatly helped. When the normal increase in rate is exceeded and the return to normal delayed, the anaesthetist is put on his guard. Undue rapidity of pulse just before taking an anaesthetic is, of course, often merely due to nervousness; this rapidity diminishes as anaesthesia comes on. In other cases it is the effect of too much tobacco, and is then not steadied down by the anaesthetic. The rapidity associated with hyperthyroidism is evidence of a dangerous state, to meet which the anaesthetist has to take special measures, particularly beforehand, the details of which, however, do not rightly come within the limits of this paper. Generally speaking, slow pulses are favourable as regards inhalation anaesthesia. A fair proportion of perfectly healthy people, particularly males, have unusually slow pulses, a rate of 50 or less being not very uncommon. If with this slow rate of pulse there are no symptoms and there is no toxic condition present, the anaesthetist need take no unusual course; the patient will react favourably to the anaesthetic and there will be but little increase in the rate of the heart's action. When the slow pulse is due to heart-block the indication is more serious, but even in this condition long and severe operations have been safely carried out. A striking example may be mentioned in illustration of the capacity of a much damaged heart to stand operation when a suitable method of anaesthesia is adopted. These are abbreviated notes of the case.

A man, aged 60, was admitted to hospital in a state of collapse, and an injection of strychnine was administered in the surgery. Examined in the ward, he looked ill, and was found to have a temperature of 95° F., pulse 60, furred tongue, and pyorrhoea. There was a history of six months' constipation and indigestion, with intermittent pain about the umbilicus for the last five weeks. For the week before admission there had been hiccup and nausea; he had eaten nothing, and passed nothing by the bowel. He had attacks of a feeling of impending collapse, with numbness and tingling of the arms, but there had been no faintness, giddiness, or palpitation. The radial pulse was easily compressed; its rate was 60, with an occasional intermission. The heart sounds were soft and irregular, premature extra-systoles being superimposed on a triple rhythmic beat. The weak extra-systoles were followed by a compensatory pause. The jugular pulse showed numerous large and small pulsations. Later examination by electro-cardiograph showed an auricular rhythm of 75 and a ventricular of 40, with complete heart-block. The pulse had now settled down to an even rate of 36, which corresponded with the apex beat and the first heart sounds. The blood pressure was 145/58. There was an intermittent soft diastolic mitral murmur, and the first sound was accompanied by a harsh murmur, conducted towards the axilla. The abdomen offered some resistance to palpation in the low epigastric and umbilical regions. An *x*-ray examination showed some ballooning of the first part of the descending colon and a definite filling defect of the descending colon. The patient could walk a few paces without rise of pulse rate or feeling tired. The abdominal trouble continued, although occasional motions were passed, and a diagnosis of a growth of the sigmoid flexure was made. The surgeon in charge was anxious to operate, and the physician consented with reluctance, believing that the heart could not stand the strain of any prolonged anaesthetic. However, the abdomen was opened, a carcinoma of the sigmoid investigated, and a short circuit between the bowel above and below the growth was made. The anaesthetic employed was a mixture of two parts chloroform with three of ether for the first ten minutes of the administration, and pure ether for the remaining forty minutes. Both were given on an open mask under which a gentle stream

left lower mandible, about three inches in extent; the apex of the triangle extended to the lower border of the left malar bone. Within the left cheek I felt a hard mass about the size of a shilling, which I attributed to a metastatic pyaemic deposit.

During the following month I made periodically free incisions into the abscess-forming area, so as to allow for efficient drainage. On October 31st the patient noticed some small "grains" upon the dressing which she was about to discard, and brought it straight to me for examination. On examining the granules under the microscope the usual filamentous network of the *Streptothrix actinomyces* was revealed. I sent a specimen to Dr. White, the district infirmary pathologist, who confirmed the diagnosis.

The diagnosis thus confirmed, the patient was put upon potassium iodide, but unfortunately, after a month of gradually increasing doses, she became intolerant of the drug, and was looking ill and losing weight. I therefore resorted to vaccine treatment. Messrs. Parke Davis supplied me with a vaccine containing 100 million actinomycosis fragments per c.cm. Intramuscular injections were given as follows: November 10th, 1924, 0.25 c.cm.; November 17th, 0.5 c.cm.; November 24th, 0.75 c.cm.; December 1st, 1 c.cm. Up to this period great improvement took place, but after the 1 c.cm. injection the affected area became very dusky in colour, the surrounding tissues were very much thickened and infiltrated, and there was every appearance of a further abscess formation; the patient herself was feeling far from well.

Presuming this to be due to some reaction taking place, I reduced the dose to 0.3 c.cm. of the vaccine, and kept to this dose weekly, from December 8th, 1924, to June 11th, 1925, with very satisfactory results—abscess formation ceased and the whole inflammatory area cleared up. At the present time the patient has regained her health and weight, and at the seat of the lesion there are some small scars, which in time will become scarcely perceptible.

It appears that the nidus of infection was in the cavity of the carious tooth. The case illustrates the importance of examining microscopically the pus of obstinate abscesses and sinuses after tooth extraction, and indicates that on the diagnosis being made, early treatment by vaccine therapy should be resorted to, especially when the patient shows iodide intolerance.

W. ROSSELL JUDD, M.R.C.S., L.R.C.P.

Ashton-under-Lyne.

SUBARACHNOID HAEMORRHAGE AS THE FIRST EFFECT OF A CEREBRAL TUMOUR.

THE following case of cerebral tumour with unusual symptoms seems of sufficient interest to be placed on record.

A man, aged 39, was admitted to the General Hospital, Birmingham, under Dr. Stanley Barnes on July 23rd, 1926. He had a long syphilitic history, having first contracted the disease in 1918. He was treated at the venereal clinic of the General Hospital over the whole period of seven years. The Wassermann reaction of the blood had been negative from 1922, and he had attended once or twice a year since for examination. For some weeks previous to admission he had suffered from intermittent attacks of giddiness and headaches, the headaches usually being preceded by a smell of burnt milk.

On admission he was only partly conscious and had a total paralysis of the left arm and leg. Lumbar puncture was performed and the cerebro-spinal fluid was found to be uniformly mixed with blood. The Wassermann reaction, both of the cerebro-spinal fluid and of the blood, was reported to be negative in each case. He recovered consciousness the following day and then had a severe headache in the right frontal region, which caused him to keep his right eye closed. No abnormality of the optic discs was found except some venous engorgement of the left.

For the next fortnight his condition seemed to improve; the paralysis cleared completely. About a week after admission there appeared the first signs of an exudate on the left optic disc. A month after admission he began to lose ground rapidly; he became more drowsy, the headache was worse, he was incontinent, and the optic discs both showed increased oedema and swelling, with numerous haemorrhages and complete filling in of the physiological cup. Further Wassermann tests of both cerebro-spinal fluid and blood were negative.

He died seven weeks after admission, and at the autopsy a tumour about the size of a Tangerine orange was found in the left temporo-sphenoidal lobe; there was a small aperture in the under surface of the tumour through which blood-stained serous fluid was still escaping into the subarachnoid space. Around this aperture there was a yellow clot from which the haemoglobin had been absorbed. The tumour was a gliosarcoma into which a haemorrhage had occurred.

It is thus clear that the slight early symptoms of headache and giddiness were coincident with the development of the tumour; that the first notable sign (unconsciousness and left hemiplegia) was due to haemorrhage into the tumour and rupture into the subarachnoid space near the apex of the temporo-sphenoidal lobe. The syphilitic infection had presumably no relation.

Birmingham. R. C. L. BURGES.

Reports of Societies.

TREATMENT OF CARCINOMA OF THE OESOPHAGUS.

AT a meeting of the Section of Surgery of the Royal Society of Medicine on November 3rd, Mr. V. WARREN LOW (President) in the chair, the subject for discussion was the treatment of carcinoma of the oesophagus.

Surgical Treatment.

Mr. F. J. STEWARD, in opening, dealt first with palliative treatment. Since the outstanding symptom was dysphagia, due to mechanical obstruction by the growth, all forms of palliative treatment were necessarily directed towards the relief of this symptom. With this end in view the lumen of the stricture might be either enlarged by dilatation with bougies, or maintained of a size sufficient for the passage of fluids by tubes of various kinds, or increased by the destruction of the growth forming the wall of the stricture by diathermy or by radium. For many years now he had not used a tube of any kind for a case of carcinoma of the oesophagus; he had always advised gastrostomy. A Witzel's gastrostomy, if performed as soon as the diagnosis was made, was quite easy to manage after the first fortnight, so that the patient or his friends were able to administer the feeds without difficulty or discomfort and could soon learn to guard against leakage. He knew that gastrostomy for cancer of the oesophagus had a bad record and a high mortality. This was the result of the operation being done too late, and often as a placebo for a moribund patient after other treatment had failed. He pleaded for its early performance as a treatment *per se*. Perhaps the most definite advantage of gastrostomy lay in the fact that it was a source of real comfort to the patient and his friends as soon as they realized that it was a sure guarantee against death from starvation. This was more than could be promised when the stricture was treated directly, whether by tube or diathermy or radium. The consequent cessation of irritative symptoms resulted in a quite unexpected lengthening of the period of survival. Two of his patients had lived for five years, and there might be others.

Mr. Steward next turned to curative treatment. Radium had been disappointing in so far as actual cure was concerned. That radium could destroy the carcinoma of the oesophagus was certain, for ulcers and tumours that had been seen through the oesophagoscope, and had been proved by histological examination to be carcinomatous, had completely disappeared after treatment with radium. But this complete disappearance resulted in only a small proportion of the cases treated, and even in these the disease, with very few exceptions, reappeared sooner or later. With regard to the future of radium treatment, to his mind the hope of improved results depended upon earlier diagnosis, more exact knowledge of the extent of the disease, and more powerful dosage. Next he discussed the question of the excision of a portion of the oesophagus as a method of curative treatment. The factors which had led to failure were: (1) rapidly fatal infection of pleura or mediastinum or both; (2) such straitness of the oesophagus that there was no slack when it was mobilized, while on the other hand it retracted longitudinally in section; (3) the peculiar structure of the oesophagus, in particular the absence of a serous coat, and the softness of its walls, which in consequence would not hold sutures at all well; (4) the great difficulty in reconstruction of the oesophagus after resection for carcinoma and for cicatricial stenosis. He believed that only three cases were recorded in which patients had recovered from an operation for removal of a carcinoma of the oesophagus; the first was recorded by Torek in 1913, the second by Lilienthal, and the third by Eggers. The study of these three cases led him to the conclusion that it would be justifiable to attempt operation in cases in which the growth appeared to be small, localized to the oesophagus, and devoid of complications, provided that the patient was in good general condition and free from visceral disease. He had explored an oesophageal carcinoma with a view to removal on three occasions, the

THE EVOLUTION OF ANAESTHESIA.

DR. S. R. WILSON (Manchester) prefaced a lantern lecture on the evolution of anaesthesia by emphasizing the great need that existed for improvement in the administration of anaesthetics for dental surgery, especially when the latter was carried out in the patient's home or in the surgery of the dental practitioner, where an operating theatre was not available. Preliminary preparation of the patient was not habitually possible. The surgeon was working against time, and there must be no risk of life to the patient either from the operation or the anaesthetic. Recovery must be rapid, and the patient, if not already there, able to go home in a short time. The case was complicated by the fact that the area of operation was common both to the surgeon and the anaesthetist. It had also to be borne in mind that suddenly and without warning the dentist might be faced with a situation of such difficulty as would require, if a general surgeon were dealing with the case, an anaesthetic lasting as long as two hours.

He noticed that a committee was now sitting to investigate the impurities in nitrous oxide gas as commercially provided, and the effects of these impurities on the patient. He would like to draw attention to a paper, published as far back as 1914, on this very subject by two Manchester dental surgeons, Hart and Minshall, which was full of information that had been practically ignored by the profession. The reports of the committee so far published were emptier of information than that of the two investigators he cited. However, the way of the pioneer was proverbially a hard one, and in his own experience twenty years had passed before the authorities awoke to the fact that there was need for a committee of investigation into the question of mule-spinner's cancer, a condition he had described when a house-surgeon.

There were three periods in the evolution of anaesthesia. The first, or pre-anaesthetic period, dated from 850 B.C. to A.D. 1776. The second, or "dawn of anaesthesia," dated from A.D. 1776 to 1844-46; while the third, or period of anaesthesia proper, dated from 1846 to the present day. Homer or Melisagenes, the blind poet of Chios, flourished in Greece *circa* 850 B.C., and the first reference to anaesthesia proper occurs in the *Odyssey*, the anaesthetist being Helen of Troy, who placed a drug in the wine whereof the soldiers drank. From this they might learn the lesson of pre-anaesthetic medication. Why had there been so much discussion on preliminary medication? Pavlov's work might eventually lead to the clarification of their ideas on this subject. Contrary to the usually accepted ideas, bromides act by brain stimulation and not by brain depression, and in the speaker's opinion caffeine would probably prove to be the drug they had been looking for all these years. Strychnine acted like caffeine. Orpheus was the first example of one who managed his patients by psychological methods, whereas when Elijah restored to life the widow's son he applied the excellent method used in anaesthetic overdose, and one which the speaker had employed with success on several occasions—oral insufflation by means of a tube, at the same time compressing the nostrils. This method could be employed at almost any place where surgical operations were done, as no elaborate apparatus was necessary, since all that was required was a couple of feet of rubber tubing, which was practically always at hand. Galen, who flourished between A.D. 130 and 200, and who for a thousand years supplied Europe with all that Europe knew of medicine, was practically silent on the subject of anaesthesia. He merely stated that mandrake had the power of paralysing sensation and motion. On the other hand, Dubartas (1544-1590) gave a perfect picture of anaesthesia in one of his poems. The speaker, when a youth, had a very poor opinion of poets as a race, but in his comparative old age he was being converted into thinking that, after all, they might have some use, and he almost admitted that he was able even to see beauty in some of their compositions. Shakespeare, in *Cymbeline*, Act i, Scene 6, depicted the queen, the wife of Cymbeline, in consultation with one Cornelius, a physician. She was a lady of racy language, who reminded him of the duchess who hitherto had not taken part in the conversation. She says:

> "Having thus far proceeded,
> (Unless thou thinkest me dev'lish,) is't not meet
> That I did amplify my judgement in
> Other conclusions? I will try the forces
> Of these thy compounds on such creatures as
> We count not worth the hanging, (but none human,)
> To try the vigour of them, and apply
> Allayments to their act; and by them gather
> Their several virtues and effects."

Cornelius was, however, doubtful of the bona fides of the lady, and, after receiving his congé, said in an aside:

> "I do not like her. She doth think she has
> Strange lingering poisons: I do know her spirit,
> And will not trust one of her malice with
> A drug of such damn'd nature. Those she has
> Will stupefy and dull the sense awhile;
> Which first, perchance, she'll prove on cats and dogs,
> Then afterwards up higher: but there is
> No danger in what show of death it makes,
> More than the locking up the spirits a time,
> To be more fresh, reviving."

Here, then, they had an excellent definition of what an anaesthetic should be, and moreover the true spirit of scientific research, dependent on experiments on animals.

The dawn of anaesthesia commenced with Priestley, who, destined for the Church, renounced the idea and became a scientist. Possibly the emanations from a neighbouring brewery had something to do with the trend of his researches and led him to the discovery of nitrous oxide and other gases, for he was born near a brewery. Priestley was, however, apparently unaware of the anaesthetic properties of his discovery, and it was left to Sir Humphry Davy to suggest that the gas might be used to lessen the pains of surgery. The suggestion, however, lay buried in his works, and it was not until Henry Hill Hickman (1800-29) devoted his short life to researches into carbon dioxide gas, nitrous oxide gas, and asphyxia that Davy's suggestion was carried into practice. The inborn opposition of the profession as a whole to any novelty was as strong in those days as in any other period of the history of medicine, and Hickman's discoveries were neglected and almost laughed at. He went to Paris, where he was met with a little more sympathy, and a committee of the Academy of Medicine there was appointed by the King to inquire into his discoveries and to report thereon. But nothing further ever came of this second attempt of Hickman, and he died a few years later a disappointed man. Crawford Long took up the tale, and it is a remarkable fact that it was his good fortune to lead a placid and happy life and to enjoy a contented old age. On the other hand, Horace Wells and William Morton both passed through a short, stormy, embittered career, and in fact it would appear as though the pursuit of anaesthesia by the pioneer workers in that art was dogged by a malignant and malevolently implacable fate, which eventually impelled those in search of the relief of pain during surgical operations to end their careers by a self-inflicted death, after a life of intolerable distress and disappointment.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

VACCINE THERAPY IN A CASE OF ACTINOMYCOSIS FOLLOWING EXTRACTION OF A TOOTH.

THIS case is of unusual interest, since on the one hand the intelligent observation of the patient led to the diagnosis, and on the other hand her intolerance of iodides led me to the use of vaccine therapy. I have also waited two years in case there should be any recurrence of the disease.

Miss P. L., aged 17, had her second left lower molar tooth extracted in July, 1924. She went on her holidays, during which period an abscess formed in the tissues around the region of the extracted tooth; this was treated by poultices and other fomentations, but as soon as the abscess had drained itself and healed this was followed by a further abscess formation and rupture of its contents. There being no cessation of these abscesses the patient consulted me in September, 1924, two months after the commencement of her trouble. I found a dusky red area, triangular in shape, the base of the triangle being below the

was very difficult to say what was going to be an operable case and what was not. On looking down the oesophagoscope and passing the bougies it was not easy to determine where the carcinoma was springing from, and still more difficult to determine the lower end of the growth.

Mr. A. L. ABEL referred to the difficulties arising from infected teeth. All the teeth should be removed (or, if the patient objected to that, all the infected teeth) before either a tube was passed or radium introduced or an operation undertaken. With regard to the question of an anaesthetic in gastrostomy, at the Cancer Hospital gastrostomies had been performed under a local anaesthetic, with no immediate mortality, and in no case the development of so-called bronchopneumonia. The way to measure the length of the carcinoma or of the stricture was first to *x*-ray the patient in the ordinary way, using an opaque drink; afterwards the patient was placed on the right side and an *x*-ray exposure made during the act of swallowing a bismuth solution. In this way one got an indication of the stricture not only from above downwards but from below upwards. If the stricture was not more than one inch in length the condition was probably operable. He had operated on a few cases through the mediastinum, one of the patients living fairly happily for eleven months afterwards. He thought there was no shock, or very little, from this operation, and it was not conceivable that the passing of a skin flap under the growth should add to the shock or danger. He had used Mr. Souttar's tubes in eight cases, but in four they were swallowed straight away, and in the other four the result was not very satisfactory. He pleaded for another attempt at surgical cure. Mr. Souttar had said that these patients came early; but they did not come to the surgeon early, though they might go to their own practitioner. They came to the surgeon only when somebody else thought it was time to have a gastrostomy done. If the patient was to wait until he had difficulty in swallowing soft solids or fluids then the chance of a cure by radical operation would be remote.

Mr. T. B. LAYTON said that a very small number of cases were suitable for operation; he was inclined to agree with Mr. Souttar's estimate of 5 per cent. Mr. Souttar had seemed to suggest that operation was not worth while, but surely it was worth while, even in a small number of cases, if the patient was fairly young. There were difficulties in selecting cases for operation. Mr. Souttar had suggested that when one looked down at the top of the growth through the oesophagoscope one could tell what condition it was in. The speaker did not think that much knowledge could be derived from the oesophagoscope on looking down it in that way. *X*-ray examination would not only reveal the bismuth held up in the narrow part of the oesophagus, but gave much information from the shadows around the growth. An enormous amount of shadow in the area around the growth was probably an indication that the growth had already spread into the mediastinum, and that the case was not very suitable for operation. He agreed with Mr. Abel's remarks as to the importance of the teeth; these should be removed very gently under local anaesthetics.

Dr. G. E. VILVANDRE spoke as one who had *x*-rayed a large number of Mr. Souttar's cases at the London Hospital—perhaps fifty during the last eighteen months or two years—and in only three or four had he found the oesophageal tube in the caecum or in any other part of the alimentary tract. In the great bulk of the cases the tube had proved quite efficient, to judge from the evidence of the barium meal.

Mr. E. D. DAVIS thought the dysphagia a very late symptom. Altogether he had done between seventy and eighty oesophagoscope examinations for carcinoma, and only one looked like an early case; all the others were advanced cases, and died within about eight months. With regard to Mr. Souttar's intubation expedient, he had had a certain number of successes in using the method, but those were cases in which the middle of the oesophagus was the part involved. At the cervical end of the oesophagus the patient would not tolerate this procedure, and at the cardiac end it was difficult and uncertain.

The PRESIDENT (Mr. Warren Low) said that his impression of these cases from the point of view of cure was rather gloomy; he would very much like to share the enthusiasm of Mr. Steward and Mr. Abel. At the same time he could not help thinking that possibly they were right. Surgical experience with other organs had always started in this somewhat gloomy way, and then one or two pioneers had come along and had shown what could be done. But early diagnosis was essential. As it was, the patient came with difficulty in swallowing, and it was not at first realized that this was an advanced case of oesophageal carcinoma. When the patient was questioned about his condition during the previous few months he would confess generally to vague pains in his chest, usually put down as "indigestion." He might have seen his doctor for these pains, or he might have gone to the *Daily Mail* and altered his diet, and ate brown bread instead of white and obtained "a little more vitamin"! Not until months afterwards was it discovered what was really the matter with him. If some frank symptom, such as the difficulty in swallowing, were awaited they would be landed with rather late cases. He had had no personal experience of Mr. Souttar's tubes, but he had seen a good many tubes used, and there seemed to him something essentially unsound in dilating a carcinomatous stricture. If any foreign body was in close relation with a carcinomatous surface there must be some irritation of that surface and some reaction, though at the same time undoubted relief was afforded so far as the difficulty in swallowing was concerned. He was in agreement with Mr. Steward that the best operative method was gastrostomy. Assuming that the carcinoma was inoperable according to present methods of examination, he was sure that an early gastrostomy was a wonderful comfort to the patient. The difficulty was the prejudice, not only of the public, but of the medical profession. He was constantly told of a doctor who had said, "I would rather die than have such a thing done to myself." But it must be remembered that the doctor was speaking from the point of view of a healthy man. The humanitarian value of gastrostomy was enormous. The high mortality was because this intervention was made too late. Carcinoma of the oesophagus, he thought, spread rather by implication of the surrounding structures than by the lymphatics. The patients died most often from invasion of the trachea or the aorta or general spread in the mediastinum. He had had several patients live for two years comfortably after gastrostomy. One patient of Sir Frederick Treves, many years ago, had a gastrostomy done for a large growth at the lower end of the oesophagus, and lived for three and a half years afterwards.

Mr. STEWARD, in reply, said he was glad that the President had given him some support in his advocacy of gastrostomy. He had not used Mr. Souttar's tubes, but he had been impressed by what Mr. Souttar had told them, and he had no doubt that in Mr. Souttar's hands this was as good a thing as could be done for the patient suffering from inoperable carcinoma of the oesophagus. With regard to the operability of these cases, he did not want to suggest for a moment that every case should be operated on. No doubt it often happened that by the time the case came forward the mediastinum was in a state of chaos; but there were other cases in which the growth could be diagnosed while it was still limited to the oesophagus and with no signs of secondary deposits. He still maintained that if the gastrostomy were done early the patient would lead a more comfortable life than with the tube.

MODERN ASPECTS OF SYPHILIS.

THE first two meetings of the Royal Medico-Chirurgical Society of Glasgow were occupied with a symposium on the modern aspects of syphilis in special and general practice. The President, Dr. JOHN COWAN, occupied the chair.

Dr. W. HERBERT BROWN, opening the discussion, limited himself to the earliest, or primary, stage of the disease in the male. In view of the amount of propaganda there had been, every member of the medical profession might have been expected to be familiar with the most important modern aspects, but this was not so, judging by the previous histories of some patients who came to venereal clinics. Patients sometimes presented themselves with secondary cutaneous and with tertiary syphilis, and it transpired that several weeks or months previously they

ages of the patients being 51, 62, and 53. All three cases ended fatally: the first rallied well from the operation, but died suddenly the next day, the *post-mortem* examination revealing nothing to account for death; the second patient lived nine days, and the third did not rally from the operation. Notwithstanding this melancholy result there were certain encouraging features in these experiences which led him to the opinion that as technique improved better results might be looked for. He based this view on the following considerations: (1) The symptoms of the carcinoma were straightforward and distinctive, so that correct diagnosis at an early stage was not difficult. (2) The disease remained localized to the oesophagus for a considerable time in all cases, and during its whole course in a large proportion. (3) The successful performance of other operations involving the mediastinal portion of the oesophagus, such as operations for fibrous stricture of the oesophagus, clearly showed that from the point of view of technique the excision of a carcinoma of the oesophagus was practicable. (4) Although so few cases had been successful, the reported cases proved the possibility of cure by operation. (5) It was perhaps not unreasonable to hope that the history of the surgery of other organs might be repeated in the case of the oesophagus. With regard to the choice of operation, he had formed the opinion that for a growth at the lower end of the oesophagus Lilienthal's would be the more suitable, while for a growth in the middle third he would prefer the operation as described by Torek.

The Intubation Method.

Mr. H. S. SOUTTAR said that he felt rather shy, after the brilliant work Mr. Steward had described, in bringing before the Section the very simple method of which he himself made use, the more so as he was afraid he entirely dissented from Mr. Steward's views as to the operability of these cases. The ground on which it was suggested that these cases were suitable for operation was that no secondary growths were found. But how often did one find a secondary growth within one year after the origin of carcinoma of the breast, and how many cases of carcinoma of the oesophagus survived a year? He had examined eighteen *post-mortem* records at the London Hospital, from each of which it was obvious that the growth had reached an entirely inoperable stage, and the condition found inside the thorax and around the oesophagus could only be described as chaos. It might be said that these were old cases; but they had died quite soon after coming into hospital, from various causes, some of them after gastrostomies. The average duration of the symptoms was 4.7 months. The speaker had just reached his own hundredth case treated for carcinoma of the oesophagus, and the average duration of the symptoms at the time he first saw these patients was 4.8 months. Surely this supported his contention that at the time when these cases were first seen by the surgeon they were already in the penultimate stage of the condition which was found *post mortem*. He did not believe that 5 per cent. of the cases which came to the surgeon were operable, from the purely pathological point of view, at the time he saw them. It might be said that these cases came late; but the man who could not swallow came at once. Many of the cases that he had seen had come to him within a few weeks or even days of the appearance of their first symptoms, and even then the condition inside the thorax revealed by the oesophagoscope was staggering. Not only that, but many of the cases examined *post mortem* had never had any oesophageal symptom of any kind—the cancer of the oesophagus was found by accident. The first symptom of this disease, interference with swallowing, appeared only at a very late stage, and by that time operation, pathologically speaking, was out of the question. In any case he did not think personally, much as he would like to do it, that it was worth attempting. Even supposing that a few completely successful results after removal of the oesophagus could be pointed to, was the operation as a routine procedure thereby justified? This was not a rare disease by any means. In a very short time he himself—and he was not a throat surgeon—had collected through the kindness of his friends one hundred cases. The annual mortality from this condition in England and Wales was 1,600. Moreover, could it be described as a cure if a section of the oesophagus were removed and the patient made unable to swallow? Many would prefer death to existence on those terms. To make the patients able to swallow comfortably until the end of their lives was all that it was possible to do in very many cases.

Intubation (Mr. Souttar continued) by the methods ordinarily adopted aimed only at the swallowing of fluids. In his own method he had provided for the swallowing of soft solids, and, after all, in the normal person, given effective mastication, soft solids were all that the oesophagus carried. He exhibited three of his oesophagoscope tubes of different lengths, 10, 14, and 18 in., which afforded remarkable facility in handling the patient. With one of these in position, the next problem was to pass through the stricture, a delicate piece of work, in which one had to be sure that the stricture itself was entered. He used a modification of a Jackson bougie, and, controlled by the oesophagoscope, in the great majority of cases the bougie could be worked through. This accomplished, the surgeon's troubles were over. He then slid down dilators of increasing diameter, up to 11 mm., over the guide and through the stricture, after which one was in a position to pass a tube of reasonable dimensions. The tubes used were of German silver wire, flattened and twisted in a curious spiral so as to prevent regurgitation of the tube. Since this spiral twist was introduced he had not had a tube coughed up, which was a common event beforehand. The results in the great majority of cases were satisfactory, and the patient, exercising reasonable precautions, was able to sit down to dinner with his family. The patients were told to have everything minced because, as a rule, they had defective teeth. The average duration of life in twenty-six cases which he had followed up to a conclusion was 5.3 months. The prospect was melancholy, because these patients must be regarded as having a fatal condition. Most of them were persons of between 60 and 70 or over, and, after all, to enable them to swallow food for perhaps a year—one of his patients went on for two years, and several for eighteen months—and to make them comfortable was to do a great deal of good, and compared advantageously with the results of gastrostomy. But he certainly hoped that in time it might be possible, at least in a certain proportion of these cases, to resect the growth and obtain a complete cure.

General Discussion.

Mr. W. G. HOWARTH said that for the last sixteen years he had had the opportunity of looking after practically all these cases at St. Thomas's, and he had tried all the recognized methods, but particularly the radium treatment of the oesophagus, not only the method employed in this country (of small doses repeated at monthly or six-weekly intervals), but also the intensive method advocated by Guisez. He was profoundly disappointed with radium in this condition. He had also used diathermy, and once a suitable electrode was obtained the result was satisfactory for the time being, though, of course, neither radium nor diathermy was more than a temporary expedient. He favoured Mr. Souttar's method; to make the patients comfortable and able to swallow, at any rate for some months, perhaps longer, was no small achievement. One saw so many of these very advanced cases in the last stages that anything one could do to relieve their distress was of the utmost importance. Large numbers of them could not even swallow fluids, and to deal with their own saliva was one of their difficulties. On the day that Mr. Souttar published his paper in the BRITISH MEDICAL JOURNAL[1] the speaker borrowed a tube from him and tried it in what proved to be his most successful case. It was that of an old lady, who lived for eighteen months with the tube in her oesophagus and had no difficulty in swallowing minced and semi-solid foods. With regard to Mr. Steward's observations about attacking the carcinoma externally, he had himself removed an oesophageal carcinoma from the upper end of the oesophagus and brought up the oesophagus to join the cut end of the pharynx. The patient was still alive after two years, and able with a minute aperture to get along fairly comfortably. His experience was that it

[1] May 3rd, 1924, p. 782.

he thought, unnecessary; he was, indeed, inclined to consider their combined use as predisposing to some of the untoward effects of therapy. He was surprised at the high incidence of syphilis in Dr. Archibald's general practice. After making a plea for closer collaboration of the physician, neurologist, bacteriologist, and others in dealing with the many problems of syphilis, the speaker discussed the treatment of nerve and cardio-vascular syphilis. His own experience of the treatment of such cases by the more modern methods had been disappointing, and he was forced to the conclusion that, in the more advanced stages of the disease in these systems, the results of modern treatment showed little if any advance on those of the older-fashioned methods. While his experience had been limited, he was disposed to think that, if they excluded the group of cases presenting a positive blood reaction and little or no evidence of gross cardiac changes, but with subjective angina, irregularity, fatigue, and general respiratory distress, the use of salvarsan products did little good and might be distinctly harmful. In congenital syphilis he had found the results of salvarsan disappointing, not only in the infant born with active syphilis, but also in late congenital disease.

Dr. DOUGLAS ADAMS referred to the very wide range of the subject under review. The necessity of remembering the biology of syphilis was emphasized, and also the importance of research with reference to the causal organism, in which little recent advance had been recorded. Prophylaxis was of supreme importance, and the necessity of prolonged treatment, with subsequent lifelong observation of the patient, was urged. The literature of the pyrexial treatment was then reviewed, and attention was drawn to the fact that artificial pyrexia had been tried solely in late neurosyphilis. The results published were conflicting, and the difficulty of drawing definite conclusions was not lessened by the limitation of its application to types of the disease in which spontaneous remissions were to be expected. If it was thought that hyperpyrexia possessed definitely spirochaeticidal effect, would it not be logical to employ it in the primary stage of the disease rather than to defer its use until the patient was dying of general paralysis? Two aspects of neurosyphilis appeared to merit special consideration. In the first place, assuming that the original syphilitic infection had been either untreated or imperfectly treated, it was essential to recognize the earliest symptoms pointing to central nervous involvement, and to correlate these with the cytological and serological changes which, at this stage, were almost invariably found in the cerebro-spinal fluid. Energetic treatment could then be instituted before irreparable nervous damage had been done. In the second place, attention to the routine examination of neurosyphilitic material cut and stained by Jahnel's method revealed surprisingly scanty evidence of the presence of spirochaetes. The experimental knowledge of *Spirochaeta pallida* was unsatisfactory, but a review of the literature revealed two important facts. The number of occasions on which *Spirochaeta pallida* had been successfully transmitted primarily to animals was very limited. In addition, the importance of *Spirochaeta cuniculi* as a source of error in experimental syphilis in rabbits had always to be borne in mind. Further research on the cultural and experimental properties of *Spirochaeta pallida* and of its distribution in the tissues held out the chief hope of a real advance in the knowledge of the subject.

Dr. T. K. MACLACHLAN said that in the treatment of syphilis of the nervous system, the older remedies, especially mercury, gave better clinical results than those of the salvarsan group. The best results were obtained in the varied clinical conditions grouped under the heading of meningo-vascular syphilis. Assidous mercurial inunction pushed to the limits of the patient's tolerance should be the routine; potassium iodide should be added after four to six weeks, but not before, as the iodine promoted the elimination of mercury, and prevented the maximum concentration in the body, which was the objective. It was advisable to give a course of neosalvarsan to stay the advance and to prevent fresh manifestations of syphilis. In the group formerly known as parasyphilis, since the main lesion was of the nervous tissue proper—the ganglion cells and fibres—tissue so specialized in function that when damaged repair did not occur, it was not possible to recognize the possibility of a cure. In dementia paralytica though an associated meningitis and endarteritis might be treated and lead to some clinical improvement, yet from the vital nature of the cells and association tracts affected the outlook could not be good. In tabes dorsalis, on the other hand, the poisoned nerve fibres were not of such vital importance, so that if antisyphilitic treatment was instituted at an early stage the advance of the spinal disease might be stayed, and, by re-education of links, useful life might be made possible for years.

Dr. O. H. MAYOR thought that Dr. Archibald's estimate of a 10 per cent. incidence was exaggerated. In two groups of medical wards at Stobhill hospitals the figures were: total number of patients 320, Wassermann tests performed in 92, positive results obtained in 19. The test was performed in all probable syphilitics, and in view of the part played by syphilis in so many "hospital" conditions the figures were remarkably low. The implication in Dr. Scott's paper that all infants showing a positive Wassermann reaction should be treated energetically with salvarsan preparations gave some cause for uneasiness. While no immediate toxic reactions were observed, late effects on the reticulo-endothelial and endocrine systems must be borne in mind, as must also the fact that a proportion of these children did not have syphilis at all, and merely gave the reaction of the maternal blood. On the question of advanced arterial syphilis he could not take Dr. A. D. McLachlan's view that asymptomatic cases ought not to be treated. Nearly all late cases of syphilis showed arterial disease. There was a strong body of opinion against treating patients with gross manifestations. The action of potassium iodide was not properly understood, and the commonly accepted ideas were probably wrong. He suggested that specific intramuscular medication was followed by undoubted benefit if the following criteria were accepted: (1) Disappearance of bronchitis, (2) disappearance of cardiac pain, (3) correction of cardiac irregularity with consequent disappearance of dyspnoea, (4) consistent fall in blood pressure, (5) increased sense of well-being, (6) diminution in size of an aneurysm.

Dr. W. G. CLARK discussed the position of the Glasgow Medical School in connexion with instruction about venereal diseases. He thought it was a matter of regret that the material for the proper teaching of these diseases was passing from the general hospitals to *ad hoc* centres under the corporation, where teaching must become secondary to the speedy cure of the patient.

PROBLEMS OF ETHER ANAESTHESIA.

AT the opening meeting of the new session of the Section of Anaesthetics of the Royal Society of Medicine, on November 5th, Dr. Z. MENNELL, the new President, after briefly referring to the success of the Section during the past year and to the visits of fellow workers in the field of anaesthetics from the Continent and the United States, invited the meeting to discuss certain controversial issues connected with the administration of ether as an anaesthetic. Dr. Mennell asked first what depth of anaesthesia under unmixed ether were they justified in indicating as the ideal when teaching students. If the deepest possible degree of anaesthesia was to be desired he wished to know whether this was safe, and, if not safe, what was the depth of anaesthesia to be aimed at? What were the effects of over-oxygenation in the administration of ether? What was the cause of apnoea in the early stages of ether narcosis with the pupils widely dilated? He called attention to the valuable and interesting information that could be obtained from examination of the vocal cords during the administration of an anaesthetic. True abdominal relaxation could not be obtained until the abductor muscles of the larynx became paralysed. In the early stages of narcosis the cords were seen as white taut glistening bands, but when the abductor muscles became paralysed these bands became pink and the tightness disappeared; it was only then that a really free airway was established and the abdominal muscles became relaxed. He mentioned a phenomenon which he called late jactitation. This was

had had genital sores, which were treated by the physician in charge by local antiseptics, with or without mercury pills and potassium iodide. This was far removed from what ought to be done in such cases, since the sequelae were so serious. The key to preventing the ravages of syphilitic infection and the social and family calamities which followed was early diagnosis with early treatment. Few diseases were more amenable to treatment, if the diagnosis was made early and the best modern treatment undertaken. Every genital sore (venereal) should be considered as possibly syphilitic until the contrary had been proved. No one, however expert, was justified in assuring a patient, from one or even several examinations, that he had not contracted syphilis. There was still a prevalent impression among undergraduates and graduates that all syphilitic sores were hard, and that non-syphilitic sores, or "soft sores," were not infiltrated. This was quite wrong, since many characteristic syphilitic sores presented no induration and the Hunterian chancre was rather a rarity. The speaker divided venereal sores into three classes: those which were characteristic of syphilis from their clinical features, the doubtful sore, and those which were characteristic of the non-syphilitic, or soft sore. In the first instance the diagnosis should be clinched by finding the *Spirochaeta pallida*. In the doubtful sore, search should be made, not once, but several times if necessary, for the spirochaete, the patient be kept under strict supervision so as to detect further evidence of syphilis, and a Wassermann test be performed every week if necessary. All patients with non-syphilitic sores should be kept under observation for three to four months, and should not be dismissed as free from syphilis without one or more Wassermann tests. Dr. Brown then gave a brief outline of what he considered a satisfactory line of treatment. Comparing the common antisyphilitic remedies, arsenic, mercury, bismuth, and the iodides, he considered arsenic in the form of one of the salvarsan preparations as pre-eminently first, and the sheet-anchor for the great majority of cases of early syphilis, but it was desirable to supplement it by the slower acting remedies such as mercury, or its new rival, bismuth. For early syphilis the intravenous method of injection was the one of choice, but the intramuscular and subcutaneous injections of suitable preparations could be adopted if there were any contraindications to the intravenous route. The importance of a thorough general examination of the patient before starting treatment was emphasized, and the urine should be examined comprehensively before every injection throughout the course of treatment. The drugs used, their dosage, and the number of injections varied with each experienced worker. In this country the intermittent treatment was generally adopted, the patient being given a course of injections, next a period of rest for six or seven weeks, then another course, and so on until an adequate amount had been given. Dr. Brown described in detail the course of treatment he preferred, and said that practically every case of early primary syphilis with a negative Wassermann reaction should receive twenty to twenty-five intravenous injections of salvarsan and some sixteen or eighteen of mercury and bismuth, or mercury be given orally. The number of injections and mode of administration were determined by the general response of the patient and the serological tests.

Dr. Madeline Archibald referred to her experience in a large industrial practice. She found the typical chancre of the textbook an uncommon phenomenon, and believed that syphilis was not so prevalent among manual labourers as among those whose occupations were sedentary. While the incidence of congenital syphilis in Glasgow had been variously estimated—as, for example, 10 per cent. (Findlay) and 8 per cent. (Elliot)—she had found the incidence of acquired syphilis to be at least 10 per cent., and possibly higher. While her conclusion might have been influenced by the fact that she was connected with a venereal hospital and a venereal clinic, she thought that her experience was not far removed from that of the average general practice in an industrial area. In the ordinary routine of practice, out of 400 patients who had had their blood tested 100 were discovered to have a positive Wassermann reaction; 70 of these were reluctant to admit the possibility of syphilis and failed to recollect the existence of a primary sore. Only seven admitted the presence of a "textbook" genital sore. Throughout a period of ten or eleven months only five cases of primary chancre came under observation, though the case incidence in her practice was higher than that in Glasgow as a whole. Of these five, three were small macules occurring on the glans penis and discovered only because the patients, having been exposed to infection, had been conducting a daily inspection. Of the remaining two, one was labial with no induration and no glandular involvement, but with a snail-track mucous patch on the soft palate; the other was on the anterior lip of the cervix, with a macular rash on the chest.

The majority of observations of the primary sore had been made in the male, while the anatomical structure in the female rendered the detection of small sores difficult, and thus the disease in a woman might escape detection till the birth of a frankly syphilitic child, or even till the child-bearing period was passed and late symptoms suddenly manifested themselves. Dr. Archibald concluded by making a plea for the early administration of neokharsivan, even amidst the routine of a busy practice, providing always that the contraindications were kept in mind and brought to light by the ordinary simple clinical methods.

Dr. J. Ferguson Smith considered the situation where the infection was already generalized, as evidenced by a positive Wassermann reaction or a secondary rash. When it was remembered that the treponema could be detected in the blood of rabbits before even the primary lesion had taken clinical shape, they might well give late primary sero-positive and early secondary cases the benefit of intensive treatment. Although such intensive treatment subjected the patient to a definite risk, that risk was worth taking when the late results of uncured syphilis were considered. It was essential to keep a very close watch on the patient's general health so that signs of intolerance should be detected at once. Albuminuria in untreated secondary syphilis was an indication for caution in using neokharsivan, and not an absolute contraindication. Albuminuria developing during arsenical treatment was, of course, a very different matter. In recent syphilis the motto was, "Strike early and strike hard." Dr. Smith detailed the course of treatment for cases of tertiary syphilis, and gave statistics of 45 patients treated under the auspices of the Public Health Department of Glasgow for at least six months. Of the 45, 39 were clinically cured, 5 improved, and 1 unimproved. This last and two of the "improved" were cases of leucoplakia linguae. Fourteen had a negative Wassermann reaction, 21 were strongly positive, 4 were positive, and 3 were doubtful. Of those with a negative Wassermann reaction, 10 had been negative for over one year, and 5 of these for over two years.

Dr. W. H. Scott dealt with syphilis from the congenital aspect; the cases could be divided into infantile syphilis and lues tarda (symptoms appearing at or after the second dentition). Both of these classes presented difficulties in treatment peculiar to themselves. In the adult the main curative agent must be one of the organic arsenic compounds, and intravenous medication was the method of choice. In infants the injections could be given into the scalp veins, and the drug was tolerated very well. The dose per kilogram of body weight could be much larger than in the adult, and toxic symptoms were very rare. No case of toxic jaundice in an infant had been encountered, and it was an interesting fact that, although the liver appeared to be affected in practically every case of congenital syphilis, the use of a drug which, in adults, was markedly toxic to the liver, and especially to a diseased liver, was not dangerous. In older children the problem was much more difficult, both as regards technique and the amount of treatment required to produce cure. The dose could not be much higher than in infants, as children at this age did not show the same tolerance to the drug. The parents of all cases of congenital syphilis should be treated if possible. The mothers rarely showed any signs of the disease, but all had positive Wassermann reactions. Treatment during pregnancy was safe and the results good.

Dr. Allison McLachlan supported Dr. Brown's plea for early diagnosis and for efficient and prolonged antisyphilitic treatment. The combination of antisyphilitic remedies was,

formation of the bony and membranous labyrinth on both sides. This was illustrated by photographs and a series of histological sections from the temporal bones, showing the deformity of the cochlea and the rudimentary state of the semicircular canals, which scarcely existed. Mr. Fraser thought that the case was not syphilitic, the child being the last member of an otherwise healthy family of twelve, and in this opinion Dr. KERR LOVE concurred.

STERNAL PAIN.

AT a meeting of the Medical Society of London on November 8th, with the President, Sir HUMPHRY ROLLESTON, in the chair, a discussion was held on sternal pain and its clinical significance.

Dr. JOHN PARKINSON said that the term sternal pain was a better one than precordial pain, for patients usually pointed to their sternum with some degree of accuracy. He briefly mentioned several lesions of the comparatively limited number of thoracic organs which gave rise to sternal pain, such as acute tracheitis or bronchitis, and also added that smoking, for example, might cause it. Turning to cardiac disease, the speaker pointed out that in certain serious cardiac diseases pain was a comparatively subsidiary symptom, as, for example, in acute pericarditis, or in the patient with rheumatic valvular disease who felt discomfort below the left breast, or in patients with cardiac failure who walked about with pain at the lower end of the sternum due to a congested liver. The more important type of sternal pain was that associated with certain forms of serious cardio-vascular disease. If the sternal pain was definitely related to effort it was probably of serious import. There were various degrees of sternal pain, some patients complaining of discomfort and others of a severe sense of constriction. The pain was usually mid-sternal, but might spread to the left arm or to the back, shoulders, or neck. Pain in such forms of cardiac disease was rarely absent; it was induced by exertion and disappeared when the exertion stopped. It might come on after a meal or when meeting a cold wind, and later, might follow slight exertion, such as getting into bed. Nervous patients rarely included the sternum in the area of their pain, which was usually under the left breast, but might extend down the left arm. In such cases of so-called "pseudo-angina" the ache was more constant and not definitely related to effort. Coming more precisely to the subject of angina pectoris, Dr. Parkinson indicated the great differences between authorities on its pathogenesis. The symptom of sternal pain was present in the majority of cases of this complaint; it might sometimes be localized in the left supramammary region alone, but never in the submammary region alone. Sternal pain on exertion was most characteristic of cardio-vascular disease, which was usually one of four varieties. Syphilitic disease of the heart and aorta was a common cause of sternal pain in a man aged 35 to 50. There might be a clear history of infection, but the Wassermann reaction would be positive. Physical examination might reveal a blowing aortic systolic, or, more characteristically, a diastolic, murmur, or the second sound might be altered. The prognosis could not ignore the risk of sudden death, but by early treatment such a variety of sternal pain might be cured. The second variety of cardiac lesion was atheroma of the aorta or coronary arteries, which was a common cause of sternal pain. The radial or brachial arteries might be thickened, but the diagnosis was usually by exclusion. The prognosis was uncertain, but in the absence of complications these patients might live for years. The third group was a subdivision of the second group, and consisted of cases of coronary thrombosis. The basis of this disease was rarely syphilis, but usually atheroma. Recent work in America had thrown much light on what used to be called the "status anginosus," which was of surgical interest in that it might simulate acute abdominal conditions. The pain usually seized the patient in the night and was like that of angina, but prolonged often for hours and accompanied by symptoms of severe shock. Later there appeared signs of cardiac failure, and the pulse became fast and perhaps irregular. This disease represented a breaking up in the entity of angina pectoris, and Dr. Parkinson insisted that the position of the profession with regard to angina pectoris was unsatisfactory. The fourth group of cases were those with high blood pressure. A small proportion of such patients complained of sternal pain, due possibly to coronary disease or to a distended aorta. Dr. Parkinson concluded by indicating the help given in the diagnosis of sternal pain by certain modern methods of investigation. Radioscopy might show the bulge of syphilitic aortitis or a dilated aorta in cases of high blood pressure. The electro-cardiograph gave information as to the state of the myocardium, since the tracing was modified or grossly abnormal in most cases of true angina.

Mr. A. J. WALTON dealt with the surgical aspect of sternal pain under several headings. Lesions of the thoracic viscera were first considered, and the speaker referred principally to those of the oesophagus. Nearly all cases of carcinoma of the oesophagus gave rise to mid-sternal pain, which was no indication of the site of the growth. The pain at first was sharp and sudden, occurring during the act of swallowing, and passing directly through to the back. Later the pain became more constant, was only slightly increased by swallowing, and was dull and aching in character. The diagnosis was generally made evident by the presence of difficulty in swallowing and the regurgitation of swallowed saliva, while it could be readily confirmed by *x*-ray examination after a barium meal or by the oesophagoscope. Mr. Walton then passed to sternal pain due to cardiospasm. In the common variety of this complaint, he said, patients sought treatment at about the age of 50. In one group the chief symptom was a somewhat indefinite pain, increased by the taking of food, situated in the epigastrium, and passing through to the back. In a second group regurgitation of food was the chief symptom, and diagnosis was easier. As the condition became more established thoracic discomfort grew more marked, often intensifying towards evening; vomiting usually occurred and brought relief. Such cases might simulate cardiac disease, but careful attention to the history and *x*-ray investigation should make the diagnosis clear. Mr. Walton mentioned the absence of any area of referred pain in these cases of cardiospasm despite the extreme distension of the viscus which occurred. He next considered lesions of the abdominal viscera, and mentioned the frequency with which patients suffering from lesions in the upper abdomen believed that they had cardiac disease. In gastric ulcer there was usually no difficulty, but in early cases the pain might be referred to the mid-sternal region, and there might also be a band of hyperaesthesia reaching as high as the nipple on the left side. Later this disappeared, and the sharply localized area of tenderness in the mid-epigastrium cleared up the diagnosis. In the case of an ulcer which had penetrated into the pancreas pain might radiate widely up between the shoulders or to the mid-spinal region, but these areas were very distinct from those of cardiac or thoracic disease. Acute dilatation of the stomach might give rise to dyspnoea and cardiac distress, but the true nature of the complaint should be revealed by careful examination. The pain of visceroptosis might sometimes simulate cardiac pain, since it was increased by exercise and relieved by lying down; but here, again, a carefully taken history and examination of the abdomen should reveal the true nature of the trouble. Mr. Walton then dealt with lesions of the pancreas and gall bladder, since chronic inflammatory affections of these two viscera might give rise to pain which was in part referred to the mid-sternum. In cases of gall-bladder and liver disease there was the characteristic pain referred to the right shoulder, and in pancreatic cases the pain was usually in the back, referred to the left shoulder. Acute attacks of colic ought not to give rise to any confusion with cardiac lesions. Coming lastly to local lesions, Mr. Walton described how a tuberculous focus in a rib or cartilage overlying the precordium, or the presence of a bony tumour in the same situation, might at first set up localized pain mistaken for a cardiac lesion. The existence of definite tenderness on pressure and a carefully taken skiagram should generally clear up the diagnosis, but the transmitted pulsation of the heart might lead to difficulty. Certain lesions of the spinal cord, meninges, or vertebral column might give rise to hyperaesthesia over the cardiac region if the nerve roots were involved. Other signs of nerve disease were generally

entirely different from the ether clonus so frequent in the early stages of ether anaesthesia, since it occurred late in the administration of the drug and was always a danger signal. Apparently it was not associated with the degree of purity of the drug, since in all cases the ether used had been subjected to analysis and found free from impurities. Some of these patients had died at a later period, a few hours after operation, and the phenomenon appeared to be of grave import in prognosis. The speaker attributed it to prolonged deep ether narcosis, and to him it was an argument against the employment of this method of administration. In this connexion he referred to an anaesthetic fatality in which peripheral dilatation of all the small vessels occurred under deep ether anaesthesia, and reported two other cases. He attributed the result to prolonged over-stimulation combined with a falling blood pressure, and mentioned in this connexion Dale's researches on histamine. Dr. Mennell described a case of death from fat embolism which occurred under ether. The operation was concerned with correcting the position of the tendo Achillis, so that there was no free fat at the site of operation which could enter the circulation. In his opinion the ether had nothing to do with the fat embolism, and the case was a surgical curiosity. Slides showed large deposits of fat in the circulation of the kidney and heart muscle. His own views were that prolonged deep ether anaesthesia was to be avoided as it was not safe. It was necessary to produce a preliminary deep narcosis with ether to ensure relaxation, but once this had been reached it was not necessary to maintain this great depth, and the pupils could be kept only moderately dilated. Over-oxygenation was to be avoided as it had undesirable after-effects.

Professor Dudgeon could not explain the mechanism of the case of fat embolism, as the operation had been performed on a part relatively free from fat. It was generally noticed in such cases that the patient was bedridden, as in the present instance. He deplored the fact that patients who died under anaesthesia were removed to a distant coroner's court, where a somewhat formal *post-mortem* examination was made. The case under review had been more fully examined than usual, the pathologist and coroner allowing material to be removed for a more extensive examination and so preserving much valuable material which was usually lost in other cases. In the patients who had died from peripheral circulatory dilatation, death occurred from shock due to dilatation of the vessels caused by the administration of ether. He asked whether such cases occurred frequently, and whether they were due to modern methods of administration. He also inquired whether cases of pulmonary thrombosis were more frequent nowadays than formerly.

Dr. L. Powell said that it was his practice to teach that the least amount of ether should be given which satisfied the needs of the surgeon. On common-sense principles saturation with ether for prolonged periods must be bad for the patient. Mr. Percy Sargent believed that death with great dilatation of the blood vessels was due either to the toxic effect of the anaesthetic or to failure of the vasomotor system. Dr. C. F. Hadfield was accustomed to teach that the size of the pupil was relatively unimportant provided that the respiration and colour were satisfactory. He had had a case of convulsions at the end of a prolonged anaesthesia; this turned out to be due to uraemic convulsions. He called attention to the danger to the patient of removing a cancerous growth from the tongue and at the same time clearing away the glands of the neck. In his experience when the double operation was performed the patient was likely to die a few hours after operation. Dr. Langton Hewer described the case of an athlete who, in extremely hot weather, was under anaesthesia for two and three-quarter hours for the correction of a deformity of a joint and who exhibited the phenomenon of late ether spasm. He asked whether, when the other cases of ether spasm occurred, the weather was also hot. Dr. H. P. Crampton declared himself an unrepentant advocate of deep anaesthesia. He gave all his patients atropine and morphine and was therefore unable to rely on the pupillary reaction, since, unless the anaesthesia was remarkably deep, his patients rarely showed much dilatation of the pupil.

EVOLUTION OF LARYNGOLOGY.

At the meeting of the Section of Laryngology of the Royal Society of Medicine, on November 5th, Dr. Andrew Wylie, in his presidential address, gave an interesting collection of references to laryngology and rhinology, gathered from folk-lore, historical sources, and general literature. Dr. Wylie began with Peacock's *Maid Marian* and Father Prout on Dr. Tagliocotius, and passed on to Swift and Catlin's *Breath of Life*. He then considered Shakespeare, Thackeray, and Fielding, and referred to the historical half-sovereign which was impacted in the air passages of Isambard Brunel, the skill of Sir Benjamin Brodie, and the resourcefulness of the patient. He told interesting tales relating to Queen Elizabeth, James I, and Charles II. This erudite address was brought to a close with Barham's description in the *Ingoldsby Legends* of his own suffering from laryngeal cancer.

Nerve Anastomosis and the Vocal Cords.

Sir Charles Ballance and Mr. Lionel Colledge demonstrated a cinematograph film illustrating the results of nerve anastomosis on the movements of the vocal cords. The film showed the normal movements of the vocal cords in a baboon, and the results of anastomosis between the recurrent laryngeal nerve and the vagus and between the recurrent laryngeal and the phrenic nerves. After the vagus anastomosis no return of movement was observed except on partial asphyxiation, but after anastomosis between the recurrent laryngeal and the phrenic the normal respiratory movements were seen to be restored. The last two sections of the film showed the larynx of a terrier dog and of a rhesus monkey in which an anastomosis had been performed between the phrenic and the recurrent laryngeal on both sides, and movement had been restored to both cords. The dog had regained the power of barking. The paralysis of the diaphragm had been overcome by anastomosis of the peripheral end of the phrenic nerve to the central end of the descendens noni, and the paralysis of the subhyoid and pre-laryngeal muscles by implanting the peripheral end of the descendens noni into the side of the hypoglossal.

FRAGILITAS OSSIUM AND DEAFNESS.

At the meeting of the Section of Otology of the Royal Society of Medicine, on November 6th, Dr. Dan McKenzie, the new President, Dr. A. M. H. Gray, and Mr. F. C. Ormerod opened the session with a series of papers on diseases of the outer ear. The paper by Dr. Gray, dealing with affections of the skin of the outer ear from the standpoint of a dermatologist was especially valuable.

Mr. F. J. Cleminson, in a paper on deafness associated with fragilitas ossium, stated that in this condition there was a triad, the complete syndrome consisting of fragilitas ossium, blue sclerotics, and deafness of the type of oto-sclerosis. He displayed family trees in which 50 per cent. of the members were affected, but each element of the triad was not necessarily present in every case. He showed a section prepared by Professor Nager of Zurich from the temporal bone of such a case. This patient had been totally deaf from occlusion of both the oval windows, and the section showed areas of oto-sclerotic bone in the neighbourhood of the cochlea and oval window. Mr. Cleminson related the clinical history of a case under his own observation in which the right arm had been broken three times, the right leg once, and probably the left upper jaw. The sclerotics were greyish-blue, and a careful examination of the ears disclosed typical signs of oto-sclerosis, Gellé's test indicating fixation of the stapes.

Mr. G. J. Jenkins, in discussing the paper, referred to the relationship between osteitis deformans and oto-sclerosis; he made it clear that oto-sclerosis might exist histologically in the subjects of osteitis deformans without causing deafness unless the endosteum was affected. Deafness might therefore have a very late onset in the course of the disease, and appear in the form of nerve deafness instead of that commonly associated with oto-sclerosis.

Mr. J. S. Fraser described the clinical history and pathological findings in a case of congenital deafness, with mal-

bees, and silkworms. At the end of the volume is a study of certain parasites of undetermined position—for example, the sarcocysts common in ruminants though rarely found in man.

The second volume, approximately equal in size to the first, begins with the sporozoa, and contains chapters on the malarial parasites of man and allied pigmented parasites of animals. In addition to two coloured plates of the parasites of human malaria, the author has introduced for the sake of comparison plates of the haemosporidia of birds, malaria of monkeys, and malaria of various mammals. The morphological resemblance of the parasites of monkeys to those of human malaria is a striking feature well brought out in these plates. Into the description of the development of this parasite in the anopheline the author has introduced a series of beautiful original drawings and coloured figures, which graphically tell the story of the life cycle in the mosquito discovered by Ross over a quarter of a century ago. The coccidia, haemogregarines, and piroplasms receive adequate attention, and the last two are depicted in colour.

In the third part of this second volume a group of non-protozoal organisms, the spirochaetes, are described. Although they belong to the realm of bacteriology, they have received so far scant attention in bacteriological works, so that their inclusion here will be welcome to medical men. The fourth part deals with methods of investigation, and with the rules of nomenclature, the latter a very apt addition to such a work. In the fifth part we find what is, in our opinion, one of the most complete extant lists of the blood parasites of vertebrates and the trypanosomidae of invertebrates. Finally, the book concludes with ninety-seven pages of references, which comprise all the most important papers, monographs, and books on the study of parasitic protozoa.

The book is, we believe, the best written on the subject in any language; it is certainly a very fine piece of work and a credit to the English school. It marks a great advance in the correlation of our knowledge of the protozoa. No medical man domiciled in the tropics or interested in the problems arising from diseases of protozoal origin should be without a copy.

ACUTE PANCREATITIS.

M. P. BROCQ, inspired by Professor P. DELBET, started in 1913 to gather material for his monograph *Les pancréatites aigües chirurgicales*,[2] which is based on 340 collected cases (20 now published for the first time), on his numerous experiments on dogs, and on a thorough survey of the literature. Although this abdominal catastrophe usually comes as a bolt from the blue, he shows reason to believe that it occurs in a pancreas already showing morbid changes, and admits that for this reason the results obtained by the experimental production of acute pancreatitis in dogs with normal pancreases are not absolutely comparable in every respect. Obesity, overeating, gastro-intestinal disorders, and especially gall stones (in two-thirds of the cases), are the most frequent antecedents. The different forms of acute pancreatitis are all derived from the same fundamental lesion—namely, necrosis, usually partial, of the gland; haemorrhage is extremely common, but fat necrosis takes more time to appear and so may not be seen in fulminating cases.

A noticeable conclusion is that the initial necrosis is aseptic and due to the digestive action of trypsin when the protrypsin has been activated by cellular kinases. Of the two hypotheses as to its causation, that which ascribes it to vascular lesions, such as thrombosis, embolism, and chronic arteritis, is shown by the author's experiments to be less probable than that which refers it to damage inflicted by way of the excretory ducts of the gland. The problem what are the factors activating the pro-ferment is discussed in considerable detail, and illustrated by the results of many experiments. The influence of bile retrojected into Wirsung's duct as the result of obstruction of the orifice of the biliary papilla is considered; only eight cases (of which one is published here for the first time with an illustration) of calculus blocking the tip of the biliary papilla are on record. But though the efficacy of bile in the pancreatic ducts to activate protrypsin is fully admitted, and Archibald and Brown's explanation that reflex spasm of Oddi's sphincter may cause reflux of bile into the pancreas is mentioned, the action of bile is regarded as one only of the possible causes of activation of protrypsin. The clinical and pathological features of aseptic forms of acute haemorrhagic, oedematous, subacute, encysted (pancreatic haematocele), and attenuated pancreatitis are described with judicious use of statistics and personal cases. Suppuration and gangrenous pancreatitis, due to superadded infection, are dealt with separately. The sections on diagnosis, clinical and laboratory, and on treatment are full, and the usefulness of this valuable book of reference is increased by a good bibliography.

[2] *Les pancréatites aigües chirurgicales.* Par Pierre Brocq. Annales de la Clinique chirurgicale du Professeur Pierre Delbet. Paris: Masson et Cie. 1926. (Roy. 8vo, pp. 188; 9 figures, one coloured. 4s. 2d.)

A HANDBOOK OF FORENSIC MEDICINE.

THE place which Hofmann's textbook of forensic medicine[3] has attained in the literature of the subject is shown by the appearance of the eleventh edition in two large volumes comprising 1,234 closely printed pages.

The original book was recognized at once as a work of outstanding merit which placed forensic medicine on a more scientific basis than it had previously occupied. The tenth, and now the eleventh edition, have, in the able hands of Professor HABERDA, fully maintained the reputation of this great work. Forensic medicine has advanced during recent years, like other sciences, with rapid strides, and no more capable editor could have been employed. Indeed, Professor Haberda has partly rewritten and greatly amplified the original. It is a complete textbook in every sense of the term, and the psychiatric part is ably dealt with by Professor Wagner-Jauregg.

Not the least valuable aspect of the present volumes is the very complete references to literature, brought down to the middle of 1926. Many new and striking illustrations have been introduced which assist the elucidation of the text.

It is a trite but eminently true remark that no one who professes this subject can afford to be without this edition of what we confidently affirm to be the most complete and accurate treatise on forensic medicine.

HARVEY LITTLEJOHN.

ECZEMA.

DR. G. A. ROST has produced a useful textbook of dermatology.[4] Without claiming that he has exhausted the subject, he has dealt with all questions which concern the general practitioner, for whom his volume is primarily intended. He has rightly devoted most space to, and laid most emphasis upon, those conditions which are the more commonly met with, and has only briefly referred to the rarer affections of the skin. In his arrangement of chapters he has adopted an etiological classification of dermatoses. Some day, let us hope, it will be possible to do this with precision, but at the present moment we are regrettably in the dark as to the causation of so many of the pathological conditions of the skin, that to try to use the tempting and apparently logical method of etiological classification is to follow a scientific will-o'-the-wisp and only lands one in a tangle of contradictions. For practical purposes it still seems preferable, after disposing of the conditions definitely known to be due to external causes, to fall back on a morphological arrangement. Apart from this objection to his scheme of classification we have nothing but praise, for Dr. Rost is very practical and fully up to date. The matter which at present is chiefly agitating the dermatological world is the question of eczema—what is meant by the word itself and what conditions may fairly be included under the title. In the present book a large number of conditions which might

[3] *Hofmann's Lehrbuch der Gerichtlichen Medizin.* Edited by Dr. Albin Haberda, Professor of Forensic Medicine, University of Vienna. Eleventh edition. Vienna: Urban and Schwarzenberg. (2 vols., pp. 1,234.)

[4] *Hautkrankheiten.* By Dr. G. A. Rost. Berlin: J. Springer. 1926. (Med. 8vo, pp. x + 405; 104 figures. R.M.27.)

present in such cases, and in tuberculous lesions the characteristic rigidity of the vertebrae should prevent any difficulty.

Sir John Broadbent stated that thirty years ago cases of angina pectoris were attributed to "fatty heart," but the modern tendency was to consider the condition as being due to coronary sclerosis. Sir James Mackenzie had taught that the pain was due to failure of contractility, and the speaker considered that there were two classes of cases: either the blood supply to the heart was affected, as in coronary disease, or the myocardium was at fault, and was leading to failure of contractility. He thought that cases of coronary disease with a positive Wassermann reaction were always fatal. Dealing with the so-called abdominal angina, the speaker said that epigastric pain coming on after exertion should not be looked upon as gastric in origin. He did not believe that syphilitic aortitis and severe aortic disease necessarily gave rise to pain.

Dr. A. Blackhall Morison referred to the close similarity between coronary thrombosis and acute abdominal lesions with regard to symptoms. He agreed with Dr. Parkinson's division of angina pectoris: the centre of stimulus could be in more structures than one, and he was heterodox enough to believe in "cardiac" pain. Even in cases of advanced syphilitic aortic disease pain might be absent. He thought that the pain in angina pectoris was due to "blood strokes," the sudden output of energy required by some sudden exertion. Angina pectoris might be divided into the direct and indirect types; a stimulus caused by some ulcerative changes in the aorta or coronary artery gave rise to the direct type. The myocardial type, on the other hand, might come on without exertion.

Dr. Poulton asserted that all types of dyspeptic sternal pain were produced mechanically in the oesophagus, and even the heart could produce such oesophageal pain. He described experiments in which a bag was swallowed and the contractions of the oesophagus recorded. When pain occurred there were usually large contractions shown, whereas if pain was absent there were no signs of high intra-oesophageal pressure. He thought the pain in "heartburn" was mechanical. Swallowing usually altered the pain in some way, and he showed illustrations of experiments in which the passage of a peristaltic wave abolished such pain, which was due to postural tonic contractions in the oesophagus.

Dr. J. A. Ryle said it was important to consider the site of production and cause of sternal pain. He emphasized the fact that a distended viscus was not painful, but pain occurred when a hollow viscus was trying to overcome some obstruction. The essential cause of pain was increased tension. He showed the striking analogy between the pain in intermittent claudication and in angina pectoris; the pain in angina pectoris was probably produced in the coronary arteries. "Heartburn" was a common variety of sternal pain, and it was peculiar in its burning character. It was wrong to assume that it was due to acid in the oesophagus. A similar burning pain occurred in tenesmus, and was probably due to the contraction of a hollow viscus with nothing to act against. The relief of "heartburn" by sodium bicarbonate depended on its action in causing relaxation of the cardiac sphincter.

Dr. Parkes Weber thought that all cases of angina pectoris might be subdivided into those with gross coronary obstruction from organic change and those without. It was a mistake to regard syphilitic cases as a separate group, as those cases with gross coronary obstruction included the syphilitic. Such a differentiation was convenient for prognosis, but the difficulty was that patients in whom gross coronary obstruction had been found after death might have had no anginal pain during life.

Sir Charlton Briscoe thought it was remarkable that so many different conditions produced the same type of pain. In every case one muscle could be found to be tender and in a state of tonic contraction. He showed slides to illustrate this. In one case of apical pleurisy the triangularis sterni on the right side was tender; in another case of angina pectoris this same muscle was also tender, and an attack was produced while testing this muscle. In other cases one or other of the intercostal muscles was affected, or it might be one of the scalene group.

Reviews.

THE PARASITIC PROTOZOA.

In the two volumes of *Protozoology: A Manual for Medical Men, Veterinarians, and Zoologists*,[1] Dr. C. M. Wenyon, director of the Wellcome Bureau of Scientific Research, has presented to scientists and medical men a work on the parasitic protozoa which will rank undoubtedly as one of the standard textbooks on this subject. The book is indeed a realization of the dreams of many teachers and research workers, in that it is an encyclopaedic compilation of the present state of knowledge of the unicellular animals which are parasitic in man and the lower animals. The two volumes contain nearly sixteen hundred pages; there are 565 figures in the text, and 20 coloured plates. The arrangement of the subject-matter and the distribution of the plates have been carefully considered and the convenience of the reader everywhere studied.

Since the discovery of the first protozoon in man, attributed to the Dutch observer Leeuwenhoek in the seventeenth century, zoologists of all nationalities have slowly built up a great edifice of knowledge; medical protozoology especially received an extraordinary stimulus in the latter part of last century by the brilliant discoveries of Laveran and Ross. During the last thirty years many more remarkable discoveries in this field of parasitology have been made. Schools of tropical medicine were founded in London and in Liverpool, and Wenyon was the first to be placed in charge of the Department of Protozoology at the London School. It therefore seems fitting that it is he who has accomplished the task of writing what might be described as the romance of the unicellular animals. It can have been no easy matter to collect, condense, criticize, and present the colossal mass of literature on the subject, but the task has been most satisfactorily accomplished. It is noteworthy that in this, a first edition, there are few typographical errors. At the beginning of each volume a comprehensive classification of protozoal organisms in general is given, and a further classification of the special groups at the beginning of each separate part, so that the student can readily study the systematic position before reading the chapter on any particular subject.

The first hundred and fifty pages of vol. i serve as an introduction. They are devoted to the definition, structure, division, physiology, organelles, and syngamy of the protozoa. Then follow sections on immunity, and the production of drug-fast strains, a matter of great importance in treatment. The remainder of this volume is concerned with the amoebae and flagellates of man and the lower animals, and with an account of those coprozoic animals which may be encountered in the examination of films during diagnosis. The section on the human amoebae contains the wonderful story of the difficulties encountered by early observers, and the final triumphal emergence of definite knowledge, so necessary in diagnosis. The subject is illustrated by a useful coloured plate showing the appearance of the various intestinal cysts of man in iodine solution.

Noteworthy sections are those on the genera *Leishmania* and *Trypanosoma*, and the description of the various problems concerned with morphology and transmission. In dealing with *Leishmania*, an account is given, accompanied by a plate, of certain vegetable organisms which may be confused with true *Leishmania*. The space devoted to trypanosomiasis is rightly very large; in addition to the classification and morphology, we have parts concerned with the pathogenicity, immunity, and the curative action of drugs and serums. It is difficult to convey in a few words to prospective readers the amount of information packed into these pages regarding the trypanosomes, but the clear manner in which these have been described, accompanied by such text figures as those on pages 470, 487, and 531, to mention only a few, will appeal to all who read the work. Then there is a useful account of the group of organisms known as the *Cnidosporidia*, which are important from an economic point of view, in that they are parasites of fish,

[1] *Protozoology: A Manual for Medical Men, Veterinarians, and Zoologists.* In two volumes. By C. M. Wenyon, C.M.G., C.B.E., M.B., B.S., B.Sc.Lond. London: Baillière, Tindall and Cox. 1926. (Roy. 8vo, pp. xxviii + 1563; 565 figures, 20 plates. 84s. net the two volumes.)

British Medical Journal.

SATURDAY, NOVEMBER 13TH, 1926.

THE VIRUS THEORY OF CANCER.

THE hypotheses put forward to explain the genesis of cancer have been legion, but for many years past there have been two that, owing to the numbers of their respective supporters and their inherent probability or plausibility, command pride of place. There is the irritation theory and there is the parasitic theory. According to the former, cancer is the result of chronic irritation: cells subjected to long-continued stimulation by some definite, or more often indefinite, means at last acquire a new property of limitless and destructive proliferation. It may be that the chief exponents of the doctrine nowadays would state it in more precise terms, but it is almost a necessary corollary that "cancer" is to them merely a generic word. According to the parasitic theory, some *contagium vivum* — protozoal, bacterial, or ultra-microscopic organism—gains access to cells and causes them to proliferate, itself multiplying within these cells and keeping up the constant division. In support of the irritation theory might undoubtedly be cited numerous examples of cancers in man where definite irritating substances had been present at their inception; and, above all, the experimental work of recent years in the production of tumours in animals by the use of various substances seemed to place the theory on a sound basis. It is one of the weaknesses of this theory that, in man at least, so very few of the subjects exposed actually develop cancerous growths, and it has been held that the irritants merely prepare the soil for the intervention of some other cause. Further, it has to be admitted that in the great majority of cases of cancer it is difficult to trace any definite sort of irritation. The ceaseless pursuit of a germ, on the other hand, had yielded no result. Some hoped that in process of time new staining methods would reveal it, just as Giemsa's stain revealed the organism of syphilis; some thought that novel cultural methods would be devised so that it could be obtained in a free condition; and some fondly believed that an ultra-microscopic parasite would be isolated from cancers. Cancer, according to them, would be a specific disease. The schools were sharply divided, and no common ground could be found.

In these circumstances the theory put forward last year by Dr. W. E. Gye attracted world-wide attention. It attempted to reconcile the two conflicting views without conceding to either all that their adherents had claimed, and to not a few it seemed as though the central problem in cancer had at last been solved. In the Lloyd Roberts Memorial Lecture, which we publish at page 865 this week, Dr. Gye traces the development over many years of experimental research that has cleared the ground for modern investigations, and he states again persuasively the original experiments he has performed and the conclusions to which these have led him. Briefly expressed, his theory is that cancer is a specific disease caused by the *combined* operation of an ultra-microscopic organism, or virus, and an accessory chemical substance which determines the special characters of the resulting cancer. It would seem as though the virus were omnipresent but incapable of producing its effect until the chemical substance has been elaborated. Hitherto this accessory factor has only been obtained from pre-existing malignant tumours, but it has been suggested that it may result in the body from the action of irritants of various kinds. The experiments on which this theory is based are again set forth. It was known that a peculiar lesion in fowls, considered by Rous, its discoverer, and by many others to be a spindle-cell sarcoma, could be transferred from one fowl to another by the filtered and presumably cell-free juice. By heat and by certain chemicals the activity of this extract could be destroyed, but Dr. Gye gives reason for believing that the extract contains two different factors which may be separated. By treatment of the filtrate with chloroform or acriflavine he suppresses one of these (the virus) and leaves the other (the chemical factor) unimpaired. Then by cultivating a portion of the fowl tumour by special technique he obtains the "virus" alone. When this cultivated "virus" is added to the "chemical factor" the characteristic Rous sarcoma is obtained on injection into suitable fowls. Neither of the ingredients alone produces the condition. Does this Rous sarcoma stand by itself, something unique, quite unrelated in etiology to other tumours? So it had been regarded. All attempts to obtain active cell-free filtrates in mammalian tumours had failed, nor could Dr. Gye repeat successfully with them the method he had adopted in the case of the fowl tumour. However, by cultivating certain mammalian cancers in his special medium he obtained something which, when combined with the Rous "chemical factor" and injected into chickens, produced the fowl sarcoma. In other words, he successfully substituted for the Rous virus some similar, if not identical, "virus."

The proof, therefore, that mammalian cancers contain a "virus" is indirect, and it is only by inference, and not by experiment, that it is permissible to conclude that they contain an "accessory chemical factor." Nevertheless, the experimentation so far as it has gone is very attractive, and the deductions are ingenious. It may be remembered that in the week following the appearance of Dr. Gye's original communication we published an article by Dr. Archibald Leitch,[1] which, though highly appreciative, yet pointed out certain weaknesses in the argument and cast doubts on the claim that the chloroform treatment had quite destroyed the activity of the filtrate; and in the same issue Dr. Twort, in our correspondence columns, suggested that other substances besides malignant tissue extracts might restore the activity of the chloroformed filtrate. If it could be shown that the active agent of the Rous sarcoma was not destroyed by the chloroform, then the whole theory would fall to the ground. Since that time a considerable amount of critical work seems to have been performed in this country and abroad which tends to support these early criticisms. Murphy of the Rockefeller Institute and Flu of Leyden, in particular, have been able to restore the activity of the chloroform-treated extracts by "cultures" of normal tissues, although Dr. Gye in his own experiments has not succeeded in so doing. At the present moment, therefore, it would appear that Dr. Gye's attractive theory, so widely broadcast less than eighteen months ago and so authoritatively sponsored, is being subjected to an artillery fire that may destroy it.

[1] BRITISH MEDICAL JOURNAL, July 25th, 1925, p. 174.

possibly be included under this head are described as due to the "status exsudativus." The author is evidently a devoted follower of Czerny, to whom we owe this conception. It cannot yet be said that this statement of the position has been substantiated, but a fair discussion such as is here given is well worthy of the attention of dermatologists. The book is well printed, easy to handle, and the illustrations, both coloured and in monochrome, good and clear. Dr. Rost's textbook should by no means be without honour in his own country, but for the British student and practitioner there are several works produced at home which will serve his purpose equally well.

Eczema has been described as the most important subject in the whole of dermatology, and Dr. S. JESSNER, who is the author of a number of monographs on dermatological subjects, primarily intended for the general practitioner, has dealt very fully with it in a small book[5] on its diagnosis and treatment. Only a few pages are devoted to the nature and etiology of the eczematous reaction, rather more to the differential diagnosis of the condition, and the remainder, about two-thirds of the whole, to its treatment. He considers in some detail the internal treatment, including dietetics and spa therapy. Like most of us, he has not a very high opinion of the efficacy of such measures, and is quite free from the fads dear to so many German writers. He rightly lays the greatest stress on local treatment, and after giving general directions goes in detail into the modifications advisable in different types of the condition, and also as it occurs on differing parts of the cutaneous surface. His teaching is quite sound, but it is interesting to note the variations of fashion in therapeutics between this country and Germany. Perhaps they are greater now than they were before the war, when every German drug and unguent was eagerly snapped up by the medical public. The fashion has now swung over to favour the French pharmacist, hardly, however, to the same degree. One of the commonest German remedies, very seldom used here, is solution of aluminium acetate, another is tumenol (a tar preparation), another is mitin (a base for ointments). Dr. Jessner does not forget to mention the use in treatment of various forms of radiant energy, such as the Roentgen rays, which he finds extremely useful, and the various forms of artificial sunlight, which he considers to have only very limited application in the treatment of eczema; in fact, he only recommends it in scrofulous eczema, a variety of the condition which in this country is hardly recognized. This little book, now in its third edition, can be recommended to any practitioner desiring guidance in dealing with eczema, and even an experienced dermatologist may pick up some tips from it.

NOTES ON BOOKS.

DR. A. C. JORDAN has published a second edition of his monograph on *Chronic Intestinal Stasis (Arbuthnot Lane's Disease): A Radiological Study*,[6] the first edition (1923) of which was reviewed in our columns (1924, i, 154). The work is much the same in substance and size as before; the preface tells us that the author has resisted the suggestion that the scope of the work should be enlarged so as to provide a complete treatise on the radiology of the digestive system, but that small additions have been made to the chapters on the pelvic colon, appendix, and gall bladder. In the case of the gall bladder there are seven lines on cholecystography and three new skiagrams, none of which, however, show the results of the new tetraiodo method. The remaining information on gall stones occupies six lines, and of them the three lines, "Gall stones are not very often seen in the *x*-ray picture, for cholesterin is perfectly transradiant, and a gall stone does not produce a shadow until it has existed long enough (years) to have become encrusted with lime salts," might be qualified or expanded with advantage. But in fairness to the author it should be borne in mind that this subject is rather outside the restricted field of chronic intestinal stasis. Criticism may also be excited by the statement that "a healthy appendix is never attacked by acute inflammation, and it does not become diseased unless its environment is unhealthy"; for, though no doubt acute inflammation often supervenes on old, it is difficult to bring forward evidence that acute infection does not fall on a previously normal appendix. As before, the get-up of the volume is good and the radiograms generally are clear.

The scientific papers which have been contributed to medical journals during the years 1923-25 by the staff of the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne, have been bound together into a single volume.[7] We notice that the staff of the institute has given a great deal of attention to hydatid disease, and seven of the twenty-two articles deal with it. The diagnosis of this disease by clinical and laboratory methods has been the chief problem studied. The other papers deal with a great variety of subjects, ranging from tuberculosis to cancer. Most of them are reprinted from the *Medical Journal of Australia*, but one or two have appeared in the *Journal of Pathology and Bacteriology*. Dr. C. H. KELLAWAY, who was recently attached to the Medical Unit at University College Hospital, London, is now the director of this institute for research.

In the form of a novel entitled *The Factory King*[8] Dr. NORMAN PORRITT, who was recently awarded the Hastings Prize, has given us a vivid and poignant account of factory life in the middle of the nineteenth century, when Richard Oastler, whom he appropriately calls "the Danton of the factory movement," made it his aim to improve the lot of the factory worker. The avariciousness of the mill owner, who drove men into unemployment and drink by the substitution of cheap labour by women and children, and the brutality of the factory overseer, are drawn in lurid colours, but Dr. Porritt assures us in the preface that he has not drawn on his imagination for the facts, but has taken his description from contemporary records and writings.

In *Man not a Machine: A Study of the Finalistic Aspects of Life*[9] Professor EUGENIO RIGNANO of Milan brings forward many arguments to refute the materialistic view that the body is a purely physico-chemical apparatus on the analogy of the growth of a crystal, and contends for the existence of a form of energy peculiar to life. Examples of pre-established and of new adaptations with a purposive object are marshalled against the mechanistic explanation of life, and in the last chapter the social purposiveness of justice and morality is brought forward in support of his thesis.

[5] *Diagnose und Therapie des Ekzems.* By Dr. S. Jessner. Third edition. Leipzig: C. Kabitzsch. 1926. (Post 8vo, pp. 173. M.6.30.)
[6] *Chronic Intestinal Stasis (Arbuthnot Lane's Disease): A Radiological Study.* By A. C. Jordan, C.B.E., M.D.Camb., M.R.C.P.Lond. Second edition. Oxford Medical Publications. London: Humphrey Milford, Oxford University Press. 1926. (Cr. 4to, pp. xv + 230; 515 figures. 21s. net.)
[7] *The Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne: Collected Papers.* Vol. II, 1923-25. C. H. Kellaway, M.D., M.S.Melb., M.R.C.P.Lond., Director. (Demy 4to; illustrated.)
[8] *The Factory King.* By Norman Porritt. London: Jonathan Cape. 1926. (Cr. 8vo, pp. 348. 7s. 6d. net.)
[9] *Man not a Machine: A Study of the Finalistic Aspects of Life.* By Eugenio Rignano, Professor in the University of Milan. With a Foreword by Professor Hans Driesch. Psyche Miniatures. London: Kegan Paul, Trench, Trubner and Co., Ltd. 1926. (Pott 8vo, pp. 77. 2s. 6d. net.)

PREPARATIONS AND APPLIANCES.

Preparations of the State Serotherapeutic Institute, Vienna.

WE have received from the State Serotherapeutic Institute, Vienna, preparations put up in a convenient form for performing certain well known clinical tests.

They include "dermotubin" or skin tuberculin (Loewenstein). This is a concentrated glycerin broth culture of the tubercle bacillus. A drop is placed on the skin and rubbed in for a minute; a positive reaction consists in the appearance of nodules after one or two days. This is obviously a very convenient and safe method of carrying out tuberculin tests, and it has been subjected to extensive clinical trials. The safety of the test is proved by the fact that it was applied to 11,000 Viennese school children without any undesirable effects being observed. (Loewenstein: *Wiener klin. Woch.*, 1925, No. 5.) Extensive reliability tests have also been performed, and the tuberculin ointment test has been found to agree with the Pirquet injection test in 90 per cent. of cases. (Kundratitz: *Zeit. f. Tuberculose*, 42, 222, 1925.) The method seems therefore to provide a very safe and easy technique for applying the tuberculin test.

Another preparation, "haemotest," consists of a small box containing the simple apparatus necessary for determining the blood group to which any patient or prospective blood donor belongs. The essential parts of the apparatus are tubes containing serum from persons belonging to blood groups 2 and 3 respectively. With this apparatus the blood group to which any person belongs can be determined in five minutes. The apparatus is arranged in very convenient form, and a full description of the technique is provided. The letterpress appears, however, to be a literal translation of German directions, and it would be clearer if the English were improved.

STUDY OF MEDICAL HISTORY.

Arrangements are being made for the formation of a History of Medicine Section at the forthcoming meeting of the British Medical Association at Edinburgh in July, 1927. A great deal of interest has been taken and research carried out on this department of medicine in the universities of the Continent, and at the present time few of the larger medical schools in America are without historical libraries. It is appropriate that the first meeting of a Section on History of Medicine should be held at Edinburgh, both because the 1927 meeting is, in a sense, historical, being connected with the celebration of the centenary of Lord Lister's birth, and still more because Edinburgh University was the first medical school in this country to recognize the importance to the practitioner of a certain amount of acquaintance with the history of his calling, by deciding to establish a lectureship on history of medicine in 1908. The course is a voluntary one, and has been held continuously every winter session since the institution of the lectureship, with the exception of four years during the war, and has been attended each year by from sixty to ninety students. The syllabus for 1926-27 shows that the course consists of twenty lectures, comprising an outline of medical history, beginning with Egyptian medicine and passing through the development of medicine among the Greeks and Romans. Hippocrates and Galen are dealt with in a biographical and critical sense, while accounts of Arabian medicine and of the medical aspects and politico-social effects of the mediaeval epidemics give pictures of medicine in the Middle Ages. The history of hospitals, including the activities of the Knights of St. John and of the foundations made by Pope Innocent III and St. Louis in the thirteenth century, together with an account of the rise of the universities and the formation of the medical guilds, outlines the Renaissance as it affected medicine. Other lectures then deal with the revival of the experimental method in connexion with medicine and its results. The early labours of Bacon and Harvey, followed by those of the group who, after the Civil War, were concerned in the foundation of the Royal Society, show the earlier stages of this movement; and the great light thrown upon bodily processes by the discovery of the microscope is demonstrated in connexion with its adoption by Malpighi, Leeuwenhoek, and others. The development of physiology is continued by an outline of the early work done and suggestions made by Van Helmont, Sylvius, Reaumur, Beaumont, and others, who turned their attention to the question of digestion and secretion, which culminated in the important researches of Claude Bernard, Karl Ludwig, and their present-day successors. The development of our knowledge of respiration, successively built up by Boyle, Hooke, Mayow, Black, Priestley, and Lavoisier, forms the subject of another lecture; while still another treats of concurrent developments of the knowledge of nervous phenomena through the researches of Willis, Haller, Bell, Magendie, Broca, and others. The later development of pathology and the progress of clinical medicine in the eighteenth and nineteenth centuries, as it took place in the various schools of France, Britain, and Germany, and the development of surgery in the eighteenth and nineteenth centuries, are also outlined. The course for the present academic year appropriately concludes with two lectures on the origin and development of the Edinburgh medical school and on the life and work of Lister.

MILK REGULATIONS IN COPENHAGEN.

The milk supply of Copenhagen is derived from some 3,400 farms in Zealand and elsewhere, with a total stock of about 54,000 cows. The daily consignment of milk to the city, exclusive of cream, buttermilk, and skimmed milk, is about 60,000 gallons, some 3,000 gallons of which are described as milk for infants and 700 gallons as Jersey milk. The regulations for the sale of milk in Copenhagen, which are quoted in a recent publication by the League of Nations, are administered by the local health committee. They deal with all milk sold in the city from its production on the farm to its place of distribution. No business for the sale of milk in Copenhagen may be conducted without notice given to the sanitary authority. "Whole milk," according to the regulations, must not contain less than 3.25 per cent. of milk fat. The cows providing it must be inspected monthly by a veterinary surgeon, who on each occasion must carry out a minute examination of the udder, testing milk from each teat. The veterinary surgeon in his certificate must indicate whether the rules laid down by the health committee for owners of herds supplying whole milk to Copenhagen are being observed. These rules are concerned with cleanliness and other points. All milk offered for sale as milk without a specific designation is held to be offered for sale as whole milk. "Milk for infants" likewise must not contain less than 3.25 per cent. of milk fat. The herd providing it must be tested with tuberculin once a year, and animals which have passed the test ear-marked. Reactors must be isolated and disposed of. Any animal added to a herd must have passed the tuberculin test. Every animal in the herd must be inspected fortnightly by a veterinary surgeon, who must certify as regards observation of the rules applying to producers of milk for infants. The use of milking machines is forbidden. The milk, after milking, must be cooled at once to 8° C. and kept in a cold place till it reaches the consumer. It must be sold only in properly closed bottles of tinted glass, which must be sterilized or carefully cleansed and duly labelled. The sale of "pasteurized milk" is prohibited unless so described. Pasteurization is defined as heating to at least 85° C. and cooling immediately thereafter to 10° C. Milk heated in any other way may not be described as pasteurized, and may not be sold at all unless approved by the health committee. Repasteurization is forbidden. Containers must be sterilized or carefully cleansed. Bottles, if used, must be of tinted glass. "Mixed milk for infants" may be sold in bottles, mixed with boiled water and containing sugar, provided the exact composition of the mixture is stated on a label affixed. "Jersey milk" may be drawn from Jersey cows only, and must contain not less than 4.75 per cent. of milk fat. The regulations also include provisions as to sick cows and infective persons, and as to milkshops in Copenhagen, their cleanliness and lime-washing, their relation to sleeping-rooms and other goods which may be sold on the same premises, and the supply of water-spittoons of a serviceable type. Of the milks named under the Copenhagen regulations, "milk for infants" is apparently the equivalent in Copenhagen of the milk designated "certified" in this country, except that on the Danish plan the herd is inspected more often but tested with tuberculin less often, while the fat requirement differs from the usages here, and no bacterial standards are laid down. "Whole milk" may be regarded as broadly corresponding to a Grade A milk in this country, except as regards the fat content and the absence of bacterial standards. It has, however, a wider range. Grade A conditions here can only be applied to persons desiring to employ the designation "Grade A." Whole-milk conditions in Copenhagen are, on the other hand, not only applicable to vendors of whole milk by that title, but are imposed also upon vendors of milk *simpliciter*, since all milk not specifically otherwise described is held to be whole milk. The useful effect of this interpretation would appear to be that all unclassified fresh milk sold in Copenhagen is produced under the condition of a monthly inspection of the herds concerned. For "pasteurized milk" in Copenhagen no bacterial standard is laid down. The general powers contained in the Copenhagen regulations

POPULATION AND PESSIMISM.

Each year there is a net increase in the population of human beings and in the number of books on the growth of human population. Dr. J. Shirley Sweeney's spiritual child, an essay entitled *The Natural Increase of Mankind*,[1] saw the light in the Johns Hopkins School of Hygiene; Professor Raymond Pearl was the obstetrician and Professor William Welch is the godfather, and the child is not unworthy of such eminent protectors.

Dr. Sweeney has made a painstaking study of the changes in the "vital index"—as Professor Pearl terms the percentage ratio of annual births to annual deaths—in practically every country which furnishes any statistics. He has found that nearly all the countries studied possess high mean indices—that is, that population is almost everywhere increasing—although the magnitude of the index and the slope of the line indicating its secular trend are negatively correlated. Further, a study of the belligerent nations showed that "the birth-death ratios, although extraordinarily lowered during the war and influenzal years, resumed their pre-war and pre-influenzal levels within two years' time." It was therefore held that "war and pestilence serve only to cause a temporary disruption in the chief factors of population growth." It was held, furthermore, that "population growth was shown to be a steady, uniform, and persistent phenomenon."

Different statisticians might prefer slightly different methods of presenting the facts—we have never been able to convince ourselves that the ratio of births to deaths is a better index than the more frequently employed rate of natural increase—but all would agree that these are trifles, and that Dr. Sweeney has effectively and succinctly presented the essential facts. What is the conclusion to which they lead? They lead Dr. Sweeney to a gloomy one. He thinks, indeed, that absolute overpopulation, in the crude sense of the term—that is, in the sense that human population will reach a point at which there is literally not sufficient food to maintain it in existence—will never occur as a *world* phenomenon; but that there will be a *relative* overpopulation, evoking some of the positive checks of Malthus, such as wars. The only remedy he can see is in deliberate limitation, but, in preference to Mr. Harold Cox's suggestion of a "league of low birth rate" among European populations, he advocates a league of "stationary populations." Whether this would really be more acceptable, as he thinks, is doubtful. It is true that there is a differential racial fertility, and it is true that "a low birth rate is a relative term, whereas a stationary population avoids the issue of discrimination in the strictest sense." But since, apart from migration (and, of course, from changes in marriage rate and age constitution), the only way in which a population now increasing can be kept stationary is by increasing the death rate if the birth rate is maintained—and nobody would advocate that—Dr. Sweeney's practical proposal is not really different from Mr. Cox's. But, again, the point is hardly more than a verbalism if Dr. Sweeney is right in being without hope that what he has said "will make the slightest impression upon things as they now are. All that is hoped is that perhaps a few minds, heretofore closed to the consideration of the matters we have brought up, may be slightly opened, and that later discussions of the population question may experience somewhat less resistance." This conclusion we take to be that of most sensible men, but if so, how is it that we are not all profoundly depressed by the prospect before the world—indeed, before our own nation? The population of England and Wales is certainly increasing. Dr. Major Greenwood's estimate[2] that by 1931 there will be three and by 1941 five millions more alive in England and Wales than in 1921 may be too pessimistic (or too optimistic, according to the point of view); but no serious prophet has budgeted for a decrease, and, if there be any truth in what masters and men are now saying, at least one industry is already employing a quarter of a million more men than economic "facts" justify, while no other industry is exactly clamouring for a quarter of a million recruits. We must, then, choose between a reduction of natural increase (whether by decrease of births or increase of deaths) and a lowering of the standard of life.

Why are we not alarmed? There are, perhaps, two reasons. One is summed up in the phrase, "It will last my time." Those who have to face the worst horrors of a war are seldom those who experienced the utmost rigours of its predecessor. And one may take that point of view without being purely selfish. How many of us have succeeded in passing on our experience of the common facts of life to our own children, in enabling our sons to avoid making precisely the mistakes we made at their age? If we cannot do this we shall certainly fail to convey our experiences of the uncommon events of 1914-18 to those born in or after 1900—that is, to those who would now form a majority, and will soon form a large majority, of the rank and file should Europe be so unfortunate as to become involved in another war. There is another factor: the religious man calls it the providence of God, the psychologist the unconscious mind. The apparently inevitable conclusion of logic has in economics, in politics, and even in medicine, so often been disproved by the event that, when the problem is a complex one, we distrust logical conclusions and assume that things will neither be so good nor so bad as reasoning would have us expect.

There is a great variety of reasons why the state of the people of England should be, on the average, much worse now than in 1914. Plenty of people assure us that it *is* much worse, and will shortly be worse still. Yet any one of the time-honoured tests—infantile mortality, mortality from tuberculosis, prevalence of the diseases associated with filth and misery—leads to the conclusion that the people are not worse but better off than before the war. Of course, these tests are not conclusive; we may be entering upon a period of increasing misery, we may even be upon the brink of some great calamity. But this at least is true, that those who, like Dr. Sweeney, have no belief in the efficacy of argument to influence the reproductive habits of mankind, even those who pay not the least attention to the jeremiads of the eugenists and care not a jot for the survival of the unfit, are often neither ignorant nor selfish, but merely humble-minded. Perhaps *tout le monde* is really wiser than any individual, even a distinguished economist, a eugenist, or a statesman.

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[1] *The Natural Increase of Mankind.* By J. Shirley Sweeney, M.A., M.D., D.Sc. Baltimore: The Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1926. (6 × 8¾, pp. 185; 1 plate. 18s. net.)

[2] *Metron.* V. 1925 (Part 2): The Growth of Population in England and Wales.

The Nobel Prize of the value of 37,000 dollars has been awarded to Dr. J. Fibiger, professor of morbid anatomy at the Copenhagen Faculty of Medicine, whose experimental production of carcinoma of the stomach in rats by a nematode is a milestone in the history of the study of cancer.

Dr. Rosenfeld's answer is that there must be a transfer, intentional or not, from one group to another. He urges that in reporting meningitis, pleurisy, pericarditis, peritonitis, etc., the physician should be required to add the words "tuberculous" or "non-tuberculous." Dr. Rosenfeld is of opinion that the establishment of State insurance systems has introduced a fallacy into statistics, at all events in countries where notification of the cause of death is not confidential, as it is in Switzerland. He believes that out of consideration for the memory of the deceased, or of the susceptibilities of his family, or in order not to admit an error of diagnosis, the physician certifies the cause of death of an insured person as "chronic bronchitis" instead of tuberculosis. Dr. Rosenfeld dwells also on difficulties due to the interpretation of terms in death certificates. According to him, in England the words "primary" and "secondary" on certificates of death indicate the relative importance of the diseases, whilst in Germany the corresponding terms indicate only the order of succession. In making this statement he may find some justification in the writings of some of those who have previously discussed the point, but it may be well to recall the exact definition of "primary" given on English death certificates—"the disease which initiated the train of events leading to death, and *not* a mere secondary, contributory, or immediate cause, or a terminal condition or mode of death." We gather that Dr. Rosenfeld thinks that Virchow's pathological classification of diseases according to their localization, instead of according to their etiology, has prolonged certain errors in the records of causes of death. This does not prevent Dr. Rosenfeld from advocating a classification of tuberculous diseases according to their localization, though how he proposes to decide that tuberculosis of the lymphatic glands or of the genito-urinary system has not arisen from pulmonary tuberculosis, or vice versa, we have no means of deciding. Anyhow, though many of Dr. Rosenfeld's statements are interesting, we are by no means certain that they are of much practical value under the present chaotic system of death certification in the various countries he deals with. What we are certain about is this: that if the Health Organization of an important body like the League of Nations thinks a report worth translating into different languages, it should employ translators who can reproduce the ideas in the language appropriate to each country, and not incommode the reader by following too slavishly the phraseology of the author.

SILICOSIS IN POTTERS.

THE General Council of the Trades Union Congress asked the Secretary of State for Home Affairs in 1923 to take steps to schedule "potter's asthma," or silicosis, as an industrial disease under the Workmen's Compensation Act. The disease, however, could not be dealt with under this Act, but only by special powers obtained under the Workmen's Compensation (Silicosis) Acts of 1918 and 1924. Before deciding to apply these powers it was thought well to establish the facts as to the incidence of the disease; and an investigation has been carried out by Dr. E. L. Middleton, medical inspector of factories, with the help of Drs. C. L. Sutherland and S. Bryson, and of Dr. A. H. John of Stoke-on-Trent as radiologist. Their report[1] has now been published by the Home Office. For those who do not live in the Potteries the report seems in need of a glossary. Few people resident elsewhere will, we imagine, understand such terms as "slipmakers," "jiggerers," "jolliers," or "sagger makers." The observers are of opinion that silicosis exists in the workers in the pottery industry to a very considerable degree, and they give a list of occupations practised in pottery work in which there is risk of the disease. We are left, however, to infer that the observers think a compensation scheme is desirable; we are only told that modellers, mouldmakers, and red marl workers, if subjected to special regulations, might be excluded from a scheme. Some interesting facts have been elicited by the investigation. Thus silicosis has been found, not only amongst those exposed to the inhalation of dry flint dust, but also in occupations such as the manufacture of earthenware, in which sand is used instead of flint; in flint-milling processes, in which the material is wet; and also in processes of manipulating the ware in the clay state before firing. Uncombined silica in the form of flint or quartz is the more important factor in causing serious respiratory disease in the industry. It appears that fibrosis of the lungs has been frequently diagnosed by medical examination earlier than silicosis has been found by radiological examination in the same occupational group. Apparently the great majority of cases were found to occur after twenty years' employment in the industry. In the report this assertion is followed by the statement: "It is significant that in the occupation where the incidence of silicosis is high it becomes evident at an early stage in the occupational history of the workers. This feature may be regarded as a true measure of the severity with which silicosis is likely to occur under given conditions." It is not clear whether this is meant to imply that silicosis in the Potteries is not a severe disease: the report gives no indication. Dr. Middleton writes that the report "should command the respect alike of those concerned with the conduct of the industry and of medical authorities who are interested in the health aspect of the subject"; nevertheless, we rise from its perusal without having acquired any precise idea of what it is thought ought to be done to remedy those disabilities to which it calls attention.

[1] Home Office report on the incidence of silicosis in the pottery industry. H.M. Stationery Office, or through any bookseller. Price 1s. 6d. net.

WEEK-END TUBERCULOSIS CONFERENCE.

A TUBERCULOSIS week-end has been arranged by the Tuberculosis Society and the Society of Superintendents of Tuberculosis Institutions from November 19th to the 22nd. Dr. Strandberg, of the Finsen Institute, Copenhagen, will read a paper on the first day, at 5 p.m., at the house of the Royal Society of Medicine, on treatment by heliotherapy and artificial light of tuberculosis, with special reference to laryngeal disease; the discussion will be opened by Sir StClair Thomson and by Mr. Somerville Hastings. This meeting will be followed by a dinner at 7 p.m., and in the evening a discussion will be held on Memorandum 37/T of the Ministry of Health. On November 20th excursions will be made to various sanatoriums and hospitals. A clinical demonstration will be given by Dr. L. S. Burrell on the morning of November 22nd at the Brompton Hospital, and this will be followed by lunch at the Welbeck Palace Hotel, where guests from foreign countries will be entertained. In the afternoon Dr. P. F. Armand-Delille of Paris will read a paper on the diagnosis of bronchiectasis and lung cavities by intratracheal injections of lipiodol. This paper will be illustrated by cinematograph films, and the discussion will be opened by Dr. F. G. Chandler. After tea Dr. George Schroder, medical director of the New Schömberg Sanatorium, Würtemberg, will give an address with epidiascope illustrations on specific stimulant therapy and protective inoculation measures; the discussion will be opened by Dr. H. Hyslop Thomson, medical officer of health for Hertfordshire. Visitors interested in these discussions and excursions are cordially invited; further information may be obtained from Dr. J. R. Dingley, Darvell Hall Sanatorium, Robertsbridge, Sussex, or Dr. F. J. C. Blackmore, Tuberculosis Dispensary, Plumstead, S.E.18.

as to infection, cleanliness, management, notices to sanitary authorities, and the like, are provided in this country either under statute or by rules and regulations. The supply of water-spittoons in milkshops, however, is not exacted here. Alike in their points of agreement and difference, the Copenhagen sale of milk regulations offer an interesting comparison with the methods current in this country for securing the great object aimed at in both cases—the purity of the milk supply.

"SOME HEART ONCE PREGNANT WITH CELESTIAL FIRE."

In *A Nineteenth Century Teacher*[1] Mrs. Liveing gives us a biography of her uncle, John Henry Bridges, sometime Fellow of Oriel College, Oxford, and medical inspector to the Local Government Board. Her story is full of pathos; for John Henry Bridges was a brilliant Oxford man who became an apostle of a lost cause. To those of us who remember in our youth the warfare of the Positivists with the Church on the one hand and with Professor Huxley on the other, a book about a disciple of Comte is bound to have an old-world flavour. It is easy to suggest that Positivist philosophy left its mark on English thought and life, and that the little band of men led by Frederic Harrison anticipated the trend of much modern action; but the fact remains that the philosophy made little appeal in the nineteenth century, and in the twentieth it has practically ceased to exist. But for his enthusiasm for the religion of humanity Bridges might have been a great historian, a great sociologist, a great doctor, or even perhaps a great administrator. As it was, Mrs. Liveing is forced to confess that the man "has not been forgotten, he has never been discovered." Bridges was a man of catholic interests, as his writings show. His *France under Richelieu and Colbert* made S. R. Gardiner deplore the sacrifice of a great historian to the Local Government Board. His work for improved Poor Law hospitals and for the control of ophthalmia and small-pox might have made the Local Government Board deplore his absorption in international politics. His views on dominion home rule, on China, and on Ireland, though really a part of his religious philosophy, might have made the internationalist and the League of Nations enthusiast of to-day jealous of his devotion to Positivism. It was this versatility and intense interest in many sides of life which caused the failure of Bridges to attain the eminence which his brilliance and accomplishments deserved. Yet who shall say that he was in any way less happy a man for that? His love of poetry, his powers of conversation, the devotion of his relatives and friends, and the knowledge of much sound work accomplished—surely all these things must have given peace and contentment to his mind. And added to this he had the satisfaction of faith in a religion of which, in England, he was in truth the spiritual head. Mrs. Liveing's study is a pleasing tribute to the memory of a great and noble, if little known, character.

SMALL-POX AND COMMERCE.

Dr. H. E. Young, provincial health officer of British Columbia, in the annual report of his department for the year ended June 30th, 1926, discusses the recent prevalence of small-pox in and around Vancouver, the chief commercial city of the province.[2] In the face of very active propaganda in Vancouver and in the capital city of Victoria, he and his colleagues managed to secure vaccination of 60 per cent. of the school children. This, with the large number of people who had been vaccinated during the war, and also those who realized the value of vaccination, placed the Provincial Board of Health in a much better position, with the result that there were only 98 cases in the period under review, compared with 1,014 in the previous year. In 1925 the United States insisted that all persons travelling south from Vancouver must show evidence of recent vaccination. The serious effects of this prohibition were not at first appreciated by the business world of the city. But its removal brought about a remarkable change in public opinion. "They realized in terms of money what the ban had meant, and they went to the other extreme and asked that the Provincial Board of Health would enact regulations that would prevent the employment of anybody unless they were vaccinated." Although this was asking too much, the Board has already gone some way in the right direction. Before the ban was raised it had urged upon the large mining interests in British Columbia the need for insisting that their employees should be vaccinated, and met with a ready and favourable response. Following this it approached the officials of the Canadian Pacific Railway, pointing out that their employees were probably more exposed than any others to small-pox, because they were in constant touch with the public and in greater danger of carrying the disease. The C.P.R. finally agreed to instruct its heads of departments that applicants for any employment which brings them into direct contact with the travelling public must either undergo vaccination or produce a certificate of successful vaccination within the preceding twelve months. Encouraged by this success, the Board persuaded the manager of Western Lines of the Canadian National Railway to take corresponding action. "We think," writes Dr. Young, "that this has been one of the greatest advances that we have made along the lines of preventing disease. The fact that these two large companies, the largest employers of labour in Canada, have made this ruling will be an argument hard to answer when other employers are approached."

INTERNATIONAL TUBERCULOSIS STATISTICS.

The Health Organization of the League of Nations appears to have set Dr. S. Rosenfeld of Vienna a Sisyphean task in the preparation of a report on an international investigation of tuberculosis statistics. No sooner does Dr. Rosenfeld roll his ponderous statistical stone up the hill on a set of rails made in Germany, than down it comes again at the impetus of a fallacy manufactured in England or Japan. Dr. Rosenfeld thinks that international statistics of tuberculosis mortality, though still far from exact, do not prevent us from following the variations in mortality provided we take the precautions he advises. He hopes that the statistics may give a solid basis for researches tending to the discovery, not only of the causes of variation in tuberculosis mortality, but also of the causes of this mortality. The investigations would be much less difficult if all countries adopted a standard nomenclature, a universal system of death certification, and proper classification, and possessed a properly educated medical profession. At present in many countries deaths are often certified by laymen; and although Dr. Rosenfeld says that "the layman is generally able to recognize pulmonary tuberculosis," and that "tuberculosis is not often overlooked, as the diagnosis is generally easy," we feel that these statements require some qualification. Apart from the difficulties that occur in countries where non-medical persons give certificates of death, trouble arises on the certificates of medical men. Why, he asks, is the death rate in England from acute and chronic bronchitis extremely high, and the tuberculosis mortality extremely low?

[1] *A Nineteenth Century Teacher: John Henry Bridges, M.B., F.R.C.P.* By his Niece, Susan Liveing. With a preface by Professor L. T. Hobhouse, and an introduction by Professor Patrick Geddes. London: Kegan Paul, Trench, Trubner and Co., Ltd. 1926. (Cr. 8vo, pp. x + 262; 1 portrait. 10s. 6d. net.)

[2] See British Medical Journal, August 1st, 1925, p. 229.

in the tests. The silver shield presented as a trophy by Earl Selborne in 1907 was won by the Pretoria Railway division, who scored 244¾ marks out of a possible 310. The silver shield presented for competition to the nursing section by Dr. Bennie Hewat of Capetown was won by the Johannesburg Railway nursing division with a score of 251 out of 300. Thus both the honours of the first day went to the Transvaal. On the second day ten teams in the men's ambulance section competed for a trophy presented by the Central Mining and Investment Corporation, Ltd., being representative of the four provinces and Rhodesia. The test was to treat a man who had fallen from a balcony and had sustained a compound fracture of the left femur. The upper portion of the broken bone protruded from the flesh, and there was severe haemorrhage. In the nursing section the teams which competed for the Lady Hoy silver rose bowl were asked to treat a woman who, in an epileptic fit, had fallen on a stove, severely burning her face and sustaining a compound fracture of the left wrist.

At the annual meeting of the Central Council for South Africa of the Order of St. John of Jerusalem, presided over by Mr. Alpheus F. Williams of Kimberley, reference was made to the Salt River railway disaster, which occurred in June, 1926, at which most excellent work was performed by the railway members of the St. John Ambulance Brigade. A letter was read from a surgeon who was present at the accident, in which he remarked that he had never seen such efficient first-aid work; within forty minutes of the occurrence of the disaster all the injured, to the number of over fifty, had been treated and removed to hospital or their homes. In regard to development a number of new divisions of the St. John Ambulance Brigade have been formed, so that there are now seventy-two divisions and three sections of a division in the Union, and one division in Rhodesia. The translation of the St. John first-aid textbook into Afrikaans had been completed, and the first edition would soon be ready for issue.

University of Capetown: Commemoration Day.

The annual commemoration day of the University of Capetown took place on September 24th; it was celebrated by an at home given by Principal Sir Carruthers and Lady Beattie at the New University site, Groot Schuur. It was favoured by fine weather, and was attended by a large number of distinguished guests, who were received by the host and hostess on the lawn in front of the old summer house, where tea was served in the open to the accompaniment of music provided by the band of the Defence Force. The New University tennis courts, which number fifteen, were formally opened; they are built in terraces on the sloping ground, which rises gradually from the back of the principal's residence to the level of the university site proper, and should suffice for the requirements of tennis-loving students for many years to come. The opening ceremony was performed by Mr. Justice F. E. Watermeyer, a past student of the South African College, from which the university has developed. After the opening of the courts a match was played between teams representing the present students and the staff, together with past students; the result was a substantial victory for the older generation.

England and Wales.

University of Durham College of Medicine, Newcastle.

Sir Thomas Oliver, M.D., has been elected to succeed Sir David Drummond, M.D., as president of the University College of Medicine at Newcastle, and, as is customary, has been made also vice-chairman of the Court of Governors. Sir David Drummond has been a member of the council of the college for forty-seven years, and became president in 1918. His retirement from office is due to his home being now at a considerable distance from Newcastle. He will remain a member of the council. Members of the British Medical Association will recall that Sir David Drummond was President of the Association in 1921, at a time when his official duties included also the Vice-Chancellorship of the University of Durham. A further change in the personnel of the college is taking place through the resignation of the honorary treasurer, Dr. Cecil Cochrane, after eighteen years' service. In that period the income of the college has increased from less than £10,000 to more than £30,000, while assets of £50,000 or £60,000 have grown to nearly £140,000. The year's deficiency of £487 has brought the total deficit in the working of the college to £2,111; but it is hoped that with improvement in industrial conditions the financial position will become better.

Tuberculosis in Lancashire.

The economic and diagnostic value of the *x*-ray installations in each of the five tuberculosis dispensary areas of the administrative county of Lancashire is emphasized by the central tuberculosis officer (Dr. G. Lissant Cox) in his annual report for 1925. By frequent screen examinations and taking skiagrams during the course of the disease the tuberculosis officer becomes skilled in their interpretation, and early cases of infection are detected with greater facility and certainty. Help in determining the suitability of patients for institutional treatment is similarly available, and expense is thus reduced. An account of the radiological work during the year is contributed by Dr. J. Logan Steward, and, illustrated by radiograms, shows how effective this method of diagnosis has proved to be in the examination of contacts and in estimating the extent and nature of the disease. One interesting fact revealed by this routine radiological examination is that acute spontaneous pneumothorax, with partial collapse of the lung, is not uncommon in cases with pleurisy, the condition persisting only for a short time and expansion of the lung being completely restored. Research work has also proceeded with reference to the fate of young children of tuberculous households, comparison of home and sanatorium treatment, the circumstances attending the failure and lateness in notifying cases of tuberculosis, the proportion of cases diagnosed primarily by *x*-ray examinations and subsequently confirmed clinically, and the types of lamps and carbons most suitable for treatment by artificial light in dispensaries. In the last particular the long-flame carbon arc has so far been found to be the most effective, with the addition of a mercury vapour lamp for local treatment. During 1925 experimental artificial light centres were established at two dispensaries, and early in 1926 mercury vapour lamps were installed in Elswick Sanatorium and the Rufford Pulmonary Hospital. Dr. Lissant Cox gives reasons for disagreeing with the present tendency to reduce the size of the administrative areas in England and Scotland; he maintains that large units are necessary if provision is to be made for the adequate hospital, laboratory, and radiological accommodation, which, with well staffed dispensaries, should be co-ordinated in a really effective scheme for preventing as well as treating tuberculosis. To this may be added the important point that in larger areas the trial of new remedies can be made on a sufficiently large scale to be valuable, and overlapping of different authorities is avoided, while the proportion of cases notified is increased. Dr. Lissant Cox believes that it is impossible for a tuberculosis officer to become a real clinical expert if he is to deal with a population of under 150,000, taking on other kinds of work in addition. The average population of each of the five large dispensary areas in Lancashire is nearly 350,000. Another indication of the value of such concerted work on a large scale is afforded by the fact that the death rate for pulmonary tuberculosis per 100,000 of the population, which was 107 in 1918, has fallen almost steadily since then, and in the year under review reached the record low figure of 67. There are now eighteen voluntary care committees at work in the county covering a population of nearly 1,800,000. Co-operation with sanitary authorities and medical practitioners is very close, and the latter continue to send more than three-quarters of their patients to dispensaries for examination prior to notification. Dr. Lissant Cox mentions the need for better education of the public with regard to the symptoms and dangers of tuberculosis, and advocates instruction of the older school children in elementary hygiene and the laws of health.

Union of South Africa.

[FROM OUR CORRESPONDENT IN CAPETOWN.]

MEDICAL ASSOCIATION OF SOUTH AFRICA (BRITISH MEDICAL ASSOCIATION), CAPE WESTERN BRANCH.

THE annual dinner of this Branch was held at Sea Point on September 29th. The occasion was noteworthy as being the first social function to be arranged by the Branch since assuming its new designation, and a company of close upon a hundred sat down. Dr. D. H. Wessels, president of the Branch, presided, and had on his right the mayor of Capetown, Mr. W. F. Fish, and on his left the chairman of the Cape Hospital Board, Mr. M. C. Vos, who is also mayor of the neighbouring township of Wynberg. Among other guests present were Mr. T. Lindsay Sandes, president of the Southern Peninsula Medical Society, and Mr. H. J. Barclay, president of the Dental Society of the Western Province, while not a few members entertained personal friends. After the customary loyal toasts had been proposed and duly honoured, Mr. M. C. Vos proposed the toast of the evening, "The Medical Association of South Africa (British Medical Association)." He heartily congratulated the medical profession on its newly obtained unity, and emphasized the point that from now onwards, on all matters pertaining to the public health and to its own interests as well, the profession could speak with one voice. The consummation of that very desirable ideal, the solidarity of the medical profession, was in large measure the direct result of the visit of Dr. Alfred Cox, Medical Secretary. In dealing with the Cape Hospital Board, a body which, rightly or wrongly, had fallen into disrepute both with the profession and the public, Mr. Vos foreshadowed that, with the reorganization about to be brought into effect, whereby the Board would be reduced in membership to exactly half of what hitherto had been its number, greater efficiency would be attained. In responding on behalf of the Medical Association of South Africa, Dr. Wessels thanked Mr. Vos for his good wishes, and called on Dr. C. L. Leipoldt, who, in a most admirable speech, drew attention to the fact that in the process of amalgamation both the British Medical Association and the South African Medical Association had made no little sacrifice. The toast of "The Medical School of Capetown" was given by Mr. H. A. Moffat, who pleaded for closer co-operation between the members of the university staff and the profession in general, and advocated the appointment of more of the younger men to subordinate posts on the teaching staff. Professor W. A. Jolly, dean of the Medical Faculty, replied in a speech brimful of dry humour, but dealt with Mr. Moffat's criticism in a serious vein, asking that more leniency be shown to a school of such recent birth. Dr. Royden Muir was allotted the privilege of proposing the health of the guests in a neat speech, to which Mr. Fish and Mr. Barclay responded. Thus ended a most successful function, which was thoroughly enjoyed by all present.

PLAGUE MEASURES IN THE CAPE PROVINCE.

Reference has already on previous occasions been made here to the incidence of plague, more especially in the Transvaal and the Orange Free State, and to the investigation of the carrier problem, which is being carried out conjointly by the Department of Public Health and the South African Institute for Medical Research. In the Cape Province, plague infection in veld rodents is known to have existed in the Kenhardt district for some two years, and from time to time warnings have been issued that the disease in man might show itself south of the Orange River, the northern boundary of the north-western districts of the Province. Quite recently plague-infected rodents have been discovered in a more southerly direction—namely, the Williston and Calvinia districts, extending as far as a point some miles north of Nieuwoudtville. The first report of a suspected case in man in this area was made on June 11th last, and coincidentally suspected mortality among field rodents was recorded in the same tract of country. Since then further cases among human beings have occurred, and so menacing has the situation become that a plague survey in the infested area has been instituted by the Department of Public Health. Dr. F. C. Willmot, assistant medical officer of health for the Union, has been actively engaged during the last few weeks in investigating what natural barriers exist to the southward, and how they may be utilized in any scheme directed to the prevention of the spread of infected rodents. There is a grave risk that enzoötic infection in veld rodents may spread to the Van Rhynsdorp and Clanwilliam districts, and thence further south along the coastal belt through the areas of Piquetberg and Malmesbury to the Cape Peninsula. So far, however, no evidence of infection has been found in the Van Rhynsdorp and Clanwilliam districts. The north-western districts, to which reference has been made, are known to be heavily infested with the Namaqua gerbille and hares. In three of the recent cases in man the patients are said to have eaten or handled dead hares. The results of the plague survey to date show that useful natural barriers against spread by field rodents to the country south of the Olifants River exist in the Bokkeveld and Cedarberg Mountains and the Doorn and Olifants Rivers with their irrigation canals. The value of such natural barriers lies in the fact that veld rodents, with one or two exceptions, will not cross water, nor are they likely to resort to high-lying ground. The authorities intend to supplement these natural lines of defence by clearing field rodents along a wide belt of country north of the Olifants River.

A MEDICAL MAYOR.

Very general satisfaction throughout the profession is felt at the election of Dr. P. A. Euvrard as mayor of Malmesbury, one of the most progressive of the country towns, situated in the heart of a fertile grain-growing district some thirty miles from Capetown. Dr. Euvrard, who had previously acted as deputy mayor, has been in general practice at Malmesbury since his return from Edinburgh, where he graduated M.B., Ch.B. in 1907. It is only fitting that his term of office should coincide with the inauguration of the new water supply system, recently officially opened by the Administrator of the Cape Province, a forward step which must prove a lasting benefit and exercise a marked influence for good on the health of the community.

THE LATE DR. JASPER ANDERSON.

There was unveiled recently, at the City Hospital for Infectious Diseases, Capetown, a tablet to the memory of the late Dr. A. Jasper Anderson, first whole-time medical officer of health to the city of Capetown, who held office for a period of many years, and who, on his retirement owing to ill health in 1923, was succeeded by Dr. T. Shaddick Higgins. The tablet, which is of marble, with gilt lettering, is let into the front wall of the building on the left of the main entrance, and bears the following inscription: "1901-1923. In remembrance of A. Jasper Anderson, M.A., M.B.(Oxon.), D.P.H.(Cantab.), M.R.C.S., F.R.S.(S.A.), Medical Officer of Health of the City, who conducted this Hospital with marked ability and success." It is fitting, indeed, that the City Hospital should be chosen as the site of such a memorial, for it owes its establishment to Dr. Anderson's initiative, having been taken over by him from the military authorities on behalf of the city council, and having been his very special care for many years. Mrs. Councillor Walsh, chairman of the public health committee, in asking the mayor to unveil the tablet, said that it was to the memory of one of their most faithful and loyal servants, who had left behind him a record which was an example to all who were attempting to follow in his footsteps. The British Medical Association, Cape of Good Hope (Western) Branch, of which the late Dr. Jasper Anderson was a past president and one of its stauncheest supporters, was represented at the ceremony by Mr. Cecil E. Jones-Phillipson, himself a past president and a member of council.

NATIONAL AMBULANCE AND NURSING COMPETITION.

The annual competition in ambulance work and nursing organized by the South African Red Cross Society and the St. John Ambulance Brigade took place at Bloemfontein on October 1st and 2nd in the Rambler's Hall, where some hundred competitors paraded on the first day to take part

was the recognized dairy research centre in Scotland, just as Reading was in England, and appeared to deprecate the formation of another dairy research institute largely independent of the College of Agriculture. It proposed the setting up of a joint university and college committee to carry out the work, but suggested that, subject to suitable arrangements being made, the college department now located at Kilmarnock might be transferred to Auchincruive. It was decided to defer consideration of the question.

Dundee Eye Institution.

The report presented to the annual meeting of the Dundee Eye Institution showed that 3,730 patients had been treated during the year—2,929 from Dundee and the remainder from a wide district in the surrounding country. During the ninety years of the institution's existence over 139,000 cases in all have been treated. Each patient made on the average about five visits to the institution during the course of the year. Greater financial assistance from country districts was needed; one district which had sent about seventy cases to the institution had contributed only 7s. 6d. There was a credit balance at the end of the year of £69.

Gifts to Glasgow Royal Infirmary.

The gift of an area of land to the Glasgow Royal Infirmary by Mr. James Macfarlane, LL.D., one of the directors, and his brother, Mr. George W. Macfarlane, on which an auxiliary convalescent hospital is to be erected at Canniesburn, was announced some time ago. The donors have now arranged to present a still more extensive area, in the belief that future developments might make a larger site desirable. To the twenty-two acres previously given, nine and a half acres have been added, and the whole of the feu duty and other annual payments is to be redeemed by the donors. Towards the cost of building the auxiliary hospital, Miss Clark, a Glasgow lady, has given £10,000 in memory of her father, Dr. Samuel Clark. The building fund now amounts to £23,500.

Ireland.

Crippled Children.

During a recent visit to Dublin Sir Robert Jones addressed several meetings in connexion with the problem of the crippled child. He expressed his approval of the proposal to co-ordinate the various cripple institutions in the country, and said that the first thing to do was to ascertain the number of patients that would have to be dealt with. Where a census of cripples had been taken, as in America and some other countries, it had been found that there were five cripples to every thousand persons. If that ratio held in the Irish Free State it must contain 12,000 or 14,000 cripples. The chief diseases that caused crippling were tuberculosis and rickets. In addition there were the cases of congenital deformity and deformity produced by injury. In England at the present time cases of infantile paralysis were occurring in fairly large numbers, but there had been a serious epidemic in America which had produced 13,000 deaths; 25 per cent. of cases of deformity were due to rickets, and about 50 per cent. to tuberculous disease. About 50 per cent. of the cases of tuberculosis of the bones and joints were to be traced to milk, and about 30 per cent. to direct contact with the human consumptive. In England it had been found that one out of ten specimens of milk examined contained living tubercle bacilli. It was absolutely essential that there should be some real strict supervision, municipal or other, of the milk that was brought into every city. That supervision should be so effectual that it would be impossible for a dirty dairyman or a dirty cow to infect the children. It should be possible to prevent the conveyance of infection from a consumptive to his child or relatives. Sir Robert Jones went on to say that he had visited the Dublin hospitals and thought the work done there was absolutely splendid, but the conditions under which the surgeons in them worked were really almost pathetic. The surgeons and physicians were struggling to make the best of a bad machine. These children's hospitals ought to be got out into the country. Little hospitals, with five or six beds, supervised by men who knew how to treat crippled children, should be started in the country, where the sun would get fair play. In England the cause had no better friends at present than the Minister of Health and the Minister of Education, not because of agitation, but because a good example had been set by voluntary effort. When the country hospitals were established in the Free State it would be possible to set up small after-care centres. In an address in the National Children's Hospital Sir Robert Jones said that in visiting a hospital like that, which had for long held a high reputation, it was sad to see the work being carried on in drab surroundings. The fact that there were from 12,000 to 14,000 attendances a year showed the tremendous amount of work being done. During investigations made many years ago he had found that out of a thousand cases of rickets 95 per cent. were due to mothers not suckling their babies. In twenty-two counties in England where sunlight hospitals had been tried it was found that sunlight and fresh air had been the salvation of the cripples. It was not necessary to go abroad to get sunshine, as with the ultra-violet rays cases could be treated during the winter months. Sir William de Courcy Wheeler, in proposing a vote of thanks to the lecturer, mentioned that three-fourths of the hospital's patients were cripples or potential cripples. It was melancholy to think that, although they did their best, it was almost impossible in the present conditions to carry on effective work with the hospital situated as it was. It had been resolved unanimously to move the hospital from Harcourt Street at the first opportunity. The Government in Ireland, he said, was thoroughly sympathetic with that voluntary movement; but the State could not be expected to do anything until the volunteers showed the way. Then the State would come to their assistance. Cappagh had set a good example, and was probably the best modern open-air hospital. The Governor-General, who presided, said that in coming to Dublin Sir Robert Jones had performed a noble act of charity. The intention to move to the country was one that would attract widespread attention. The motion was passed with acclamation. In proposing a vote of thanks to the Governor-General, Sir William Taylor said, with regard to the removal of that hospital to the country, that he felt the need for the amalgamation of another hospital doing similar orthopaedic work in the city. The move could not be made without money, and amalgamation with another hospital that dealt with crippled children on similar lines would encourage the public to help.

Ulster Medical Society.

At the second meeting for the session of the Ulster Medical Society, on November 4th, the President, Dr. M. J. Nolan, read his opening address on "Insanity: its protean aspects in relation to bodily disease." Dr. Nolan said that in his early days he had had experience of general practice which had been of great value to him when he became an alienist; it showed him the many relations between insanity and bodily disease, and how the two departments were constantly coming into contact with each other; in 150 consecutive admissions to the Down District Asylum nearly every one required some physical attention. The experience also pointed to the principle that an asylum was a hospital to treat body and mind. No scientific definition of insanity had been generally accepted, but, for himself, he had adopted that of Mercier in 1890, which was that insanity is a disorder of the process of adaptation of the individual to his surroundings; psycho-pathology must give, not merely a description, but an explanation of the bases of mental disorder. Dr. Nolan then showed some charts of the physical causes of insanity, as given on admission by patients, and pointed out that there were more contributory than primarily causative factors. The most frequent was heredity; it did not produce insanity, but a neuropathic tendency might lead in many directions—for example, to tubercle, exophthalmic goitre, as well as to insanity. The head of the sperm cell, with all its inherent

CENTRAL MIDWIVES BOARD.

The Central Midwives Board for England and Wales held a penal session on November 4th. Sir Francis Champneys, Bt., presided. In reply to a request for advice from the Joint Nursing and Midwives Council for Northern Ireland, the Board expressed the opinion that the fact that medical help became necessary to apply forceps did not prevent a case being counted to a pupil, provided that the pupil had made abdominal and vaginal examinations. The Board considered, however, that cases of Caesarean section should not count to a pupil. Dr. Harrison, resident medical officer, was approved as a lecturer to pupil midwives at Bagthorpe Infirmary, Nottingham, for six months pending the arrangement of a scheme with the authorities of the Collin's Trust Maternity Home, for the delivery of a single course of lectures in Nottingham. The report on the work of the Board for the year ending March 31st, 1926, was amended and approved, and signed by the chairman and secretary for transmission to the Ministry of Health.

THE MEDICAL MAYOR OF EXETER.

The new Mayor of Exeter, Mr. Ransom Pickard, is a distinguished member of the medical profession. After studying at St. Bartholomew's Hospital he graduated M.S.Lond. in 1892, and M.D. in 1893, having obtained the diploma F.R.C.S. in the previous year. He commanded the 1st Wessex Field Ambulance from its formation until July, 1917, when he became A.D.M.S. of the 48th South Midland Division, holding this post until demobilization in April, 1919. He landed in France with the 8th Division in November, 1914, and left France for Italy with the 48th Division in November, 1917. He was engaged in repatriating prisoners of war from Bavaria and the Tyrol during the winter of 1918-19. He was mentioned in dispatches five times, and obtained the Mons star and the Italian Croce di Guerra. For his distinguished services he was awarded the C.B. and the C.M.G. For several years Mr. Ransom Pickard has been a member of the South-Western Branch Council of the British Medical Association; he was vice-president of the Section of Ophthalmology at the Annual Meeting in 1923, and he is a member of the central Ophthalmic Committee.

Scotland.

INFLUENCE OF FOOD ON HEALTH.

THE sixth annual conference of the Scottish Council of Women Citizens' Associations was held at Dumfries on October 30th. Lady Leslie Mackenzie, chairman of the council, presided, and Dr. Chalmers Watson (Edinburgh) gave an address on "Diet and sunshine," in which he said that the best results in regard to prevention of disease could only be obtained by intelligent co-operation between the educated public and the medical profession. He referred to the remarkable evolution in recognition of disease conditions which had taken place in the last twenty or thirty years, and expressed the belief that many diseases now commonly recognized as adenoids, appendicitis, pyorrhoea, and neurasthenia were largely dependent on changes that had taken place in diet. There had been a gradual diminution in the consumption of natural foods, which had been replaced by foods prepared or preserved by methods which interfered with their nutritive value. He believed that medical treatment required by children of middle-class families, which commonly involved operations for removal of adenoids, later for appendicitis, and later still regular dental attention for the development of trouble in the teeth, was directly due to the parents' ignorance of the fundamental laws of sound nutrition. The nation, he believed, had departed a long way from the system of nutrition which had reared in the past a race that was physically and mentally virile. In the past twenty years the nutritive value of bread had been enormously impaired by artificial methods of treatment in response to the public demand for a white bread. The consumption of oatmeal, which formerly entered largely into the national dietary in Scotland, had fallen. The amount of milk consumed per head was very far behind the figure in America and Denmark. He believed that for the early periods of growth pure milk supplied from tuberculin-tested cows was the most valuable foodstuff available, and that its greater use could be advantageously extended to the young adult. At the present day large sums of money were annually spent in the purchase of proprietary milk foods, which were both more expensive and less valuable than the natural product. Most of the diseases of old age, also, he held to be preventable. At a later stage of life neurasthenia, rheumatism, high blood pressure, and kidney or heart disorders, and later still premature old age, were largely due to a defective system of feeding and drinking. It was important, too, to remember that sunshine entered largely into the formation of good milk as well as into the composition of vegetables and fruits, which could advantageously be eaten raw. Dr. Livingston, Convener of the Public Health Committee of Dumfries Town Council, emphasized the point with regard to the necessity for proper care of the teeth in the prevention of disease. He believed that if Robert Burns were alive to-day he might have modified his grace before meat to read:

> "Some ha'e meat an' canna eat,
> An' some would eat that want it,
> But we ha'e meat and we can eat,
> God gi'e us teeth to munch it."

Dr. Joseph Hunter, M.O.H. for Dumfries, said that dietetic reforms had made less impression on the general public than was desirable, largely because there were so many faddists and cranks in regard to what ought and ought not to be eaten. Common sense should be applied to this matter, and articles of diet found unsuitable for individuals should be withdrawn from the daily diet. Mr. Allan W. Ritchie, chief sanitary inspector, Edinburgh, in a paper on food handling, urged that cleanly practices were necessary in every aspect of food supply, from the place of production to the home of the consumer. Progress had been made in regard to bread by the provision of many hygienic bakeries, but in the generality of bakehouses there was still need for a higher standard. A system of medical examination of persons employed in certain sections of the food industry was urgently required. The exposure of food in shop windows and on counters and shelves, although intended to attract customers, should arouse repulsion, owing to the possibility of contamination by dust and flies, and shops connected directly with dwelling-houses were unsuitable. He thought that improvement could be achieved both by education and by legislation. The conference passed a resolution urging upon the Scottish Board of Health that local authorities should be provided with further powers to control by registration, regulations, or inspection all places where food is produced, sold, stored, and distributed.

DAIRY RESEARCH.

At a special meeting of the governors of the West of Scotland Agricultural College, held in Glasgow on November 1st, the proposal of the Secretary of State for Scotland for the establishment of a dairy research institute for Scotland was considered. An offer was made about a year ago by Mr. John M. Hannah of Girvan to give a portion of the estate of Auchincruive, Ayr, including a mansion house, to the governors of the college, for the purpose of an agricultural college and dairy school. The offer, however, involved the transfer of the college in Glasgow to Auchincruive, and the governors, therefore, had rejected it. In the interval the offer had again been made to the Secretary of State for Scotland for the purpose of furthering agricultural education and research in the south-west of Scotland, with the special view of affording courses in agriculture and dairy research. At a meeting of representatives of the University of Glasgow and the Agricultural College on October 13th the Secretary of State had expressed the view that a dairy research institute should be promoted in the West of Scotland, that it should be in close relation to the Agricultural College, although under its own governing body, and that the estate of Auchincruive was suitable for such a research institute, where courses on dairy management might be given. A committee of the college had pointed out that Kilmarnock

not be breast-fed for a few months. Bottles are then started of prepared cow's milk, with some highly manufactured carbohydrate patent food. At 10 months of age it gets white bread sop, rusks and biscuits added, and at a year vegetables put through a sieve. If lucky, it may get, soon after this, finely minced meat, though this advance is often delayed or a patent preparation of nuts substituted. The shelves of any modern nursery groan with tins of patent malted foods, pre-digested cocoa, patent rusks, patent preparations purporting to contain eggs in a highly digestible form, and curious substitutes for porridge; and the medicine cupboard is laden with bottles of syrup of figs, liquid paraffin, cough mixtures, and the like.

The results are often deplorable, and the physique of many children, whose parents want for nothing, is a disaster. They are nervous, suffer from obscure diseases, attributed to teething, and enlarged tonsils and adenoids are the rule rather than the exception. The remedy is to get back to nature, and as near as possible to the diet on which man has evolved from the ape. Let the baby be breast-fed till it no longer needs it. If this is really impossible the only adequate substitute is fresh Grade A cow's milk diluted suitably. Teach the infant to eat and drink from a cup, not a bottle, as early as possible, and supplement the breast milk with natural foods—fresh meat, fresh fish, fresh eggs, and fresh vegetables and fruit, without prepared or patent foods of any kind. A healthy breast-fed baby will take all the above-mentioned articles of diet well at 7 months of age, and by the time it is 10 months will be able to take all ordinary articles of diet and need only half a pint of milk a day. This is a fact that I have proved many times, and the results are infinitely better than by the older method.—I am, etc.,

Clifton, Bristol, Nov. 6th. RICHARD C. CLARKE.

SIR,—Dr. Harry Campbell suggests that "we can reach an even deeper level of truth concerning human dietetics by studying the diet of the pre-agriculturists" than by studying the diet of comparatively primitive agricultural peoples. In the sacred legends of the natives with whom I am best acquainted—the New Zealand Maori—the cultivators are regarded as improved man, and the hunters as unimproved man. Man is said to be an improved monkey, and the monkeys are termed "ancestral peoples." The diet of these ancestral peoples consists of the "wild" foods of vegetable origin; the diet of the hunters (the pre-agriculturists) consists of "wild" foods of animal and vegetable origin. In Maori philosophy cultivation was beneficial; conquest was deleterious—fatal ultimately to the conquerors. Those who could not cultivate the dietetic means of life ultimately lost life itself.

If we take the four races of mankind—the black, the yellow, the brown, and the white—we find that the blacks have mostly remained in Africa; the yellows have mostly remained in Asia; the whites are mostly in Europe, and in recent times in America and Australasia; but the browns have increased and multiplied all over the earth, they form what Huxley termed a "belt of dark-whites." The founders of the British Empire went to so-called new countries, but these new countries had previously been discovered by the dark-whites, and cultivated to a greater or less extent by them.

The diet of these dark-whites consisted mainly of vegetable foods, with fish and bird. These vegetable foods were mainly the aroid roots, sweet potatoes, fern-root, cassava, etc., all of which were grown in terrace, pit, and surface cultivation; with sow-thistle, fern-shoots, etc., used as we use spinach; various fruits and nuts were also eaten. Vegetables as well as fish and bird were smoked and dried. From the Americas across to New Zealand the cereal was maize, roasted and ground, boiled, and sometimes germinated and then cooked. The cooking was a prolonged process of steam-roasting in the ground ovens, and foods—such as bitter cassava—which were unwholesome or poisonous raw were by cooking rendered palatable and nutritious. Purgative leaves or herbs were cooked with binding foods; or sacred earth (ashes or sand) was added.

The sacred legends taught that the bowels were the seat of health, and that evacuation must occur two or three times a day; otherwise "the inner man" was regarded as out of order. The remedy then was rest from food and the taking of herbal beer (made from the sow-thistle), with exercises specially designed to facilitate evacuation. It is true that the peoples holding these views of life appear to have been "conquered" by the white race, but history and pre-history appear to reveal a succession of such conquerors, with the brown peoples or dark-whites ultimately again in possession in the long slow course of the ages, because the white race can conquer and exploit, but apparently cannot yet create and cultivate, and so ultimately it perishes of the so-called diseases of civilization. Our contact with the native races appears at first to be fatal to them. If they fail to be benefited by our superior accumulations of knowledge doubtless they deserve to perish. But, if we fail to be benefited by their superior wisdom in cultivation, we cannot survive—excepting in the sense that the ancient Greeks and the ancient Romans are still here.—I am, etc.,

London, W.1, Oct. 3rd. ETTIE A. ROUT (Mrs. F. A. Hornibrook).

THE DEVELOPMENT OF VAGINAL OPERATIONS FOR GENITAL PROLAPSE.

SIR,—I desire to thank Dr. R. H. Paramore for his courteous and thoughtful reply on August 21st (p. 360) to my letter in your issue of August 7th (p. 274), and to tell him that I read both reviews of his volumes of *Statics* when they appeared in the *Medical Journal of Australia*, as well as the volumes themselves, and was struck by the ability with which the subject was presented. It is therefore with much regret that I find myself unable to agree with the statement that the cardinal ligaments, "from their structure—in virtue of their non-striped muscle content—are not capable of sustaining the pressure which during life is continuously tending to depress the uterus." On the contrary, it is in virtue of this very fact, their non-striped muscle content, that they are the main supports of the uterus; and this view is emphatically borne out by Professor A. F. Dixon, as mentioned in my previous letter.

Your other contributor, Dr. J. W. Bride (August 21st, p. 361), cites the work of Cameron and Derry, quoting vaguely from Elliot Smith's article in the *Journal of Anatomy and Physiology* (April and June, 1908). But their work refers only to the pelvic fascia and says nothing whatever about the all-important muscle bundles, which radiate laterally outwards from the neck of the uterus and form the "non-striped muscle content" above referred to. So that, as far as the origin, structure, and functions of the cardinal ligaments are concerned, the work of Cameron and Derry is valueless. Professor Elliot Smith points out that his own work "deals mainly" with the pelvic fascia and the mesodermal sheaths of the pelvic blood vessels and viscera in the male.

Dr. Bride objects to the term "ligament" as applied to the structures under discussion. Perhaps they are not ligaments in the strictly anatomical sense. Neither are the infundibulo-pelvic, the utero-sacral, even the broad "ligaments" themselves, and quite a number of others in human anatomy, but the term is found useful and convenient by the operating surgeon and is justified by custom.

In the paper read by Dr. Fothergill before the Obstetric Section of the Royal Society of Medicine in December, 1907, to which attention is significantly directed, it is stated that the support of the uterus "is accomplished by the fibrous sheaths of the blood vessels and accompanying structures which supply the uterus." In closing the discussion, however, the President of the Section, Dr. Herbert Spencer, with his usual acumen, said that "anyone who had performed a total abdominal hysterectomy . . . would find it difficult to accept the statement that it was the sheaths of the vessels that kept the uterus in place." Probably the same difficulty will present itself to most of your readers.

In conclusion, it remains to be added that, from the facts adduced in this and my previous letter, it may be justly

potentialities, was the greatest marvel in creation. Preventive measures in the propagation of the unfit dealt with the parents, and did not remove atavistic recurrences in apparently healthy parents. Prolonged mental stress, tubercle, alcoholism, syphilis, heart disease and cardio-vascular affections, sexual excess, the practice of contraception, the climacteric, sexual deprivation, were then described in order and their relative importance considered; numerous illustrative cases were related, especially that of an alcoholic father and a weak-nerved mother, who had eight children, many of whom suffered from Friedreich's disease, while the others were more or less weak-minded. The duty of the alienist was to get as full a knowledge of the patient, body and mind, as possible; thus only would he discharge his duty to the patient and to the public. Some important principles of treatment were emphasized, and the evils that might be caused by psycho-analysis carried out by those not properly equipped and trained were mentioned. Colonel Dawson proposed a hearty vote of thanks to the President for his address, and congratulated him on the large and liberal views expressed; this was seconded by Dr. Calwell, and passed with acclamation.

Tuberculosis Mortality in Dublin.

Mortality from tuberculosis has been reduced considerably in recent years in Dublin. Earlier diagnosis, better treatment, and greater care exercised by the patients to prevent infection have contributed to this condition. The very high death rate, however, is sufficient to impress the necessity for still greater effort to stamp out the scourge. In Dublin the mortality from tuberculosis in the past ten years has shown a great decrease (more than 50 per cent.), as the following table shows:

	All forms.	Pulmonary.		All forms.	Pulmonary.
1916 ...	1,390	1,065	1921 ...	749	583
1917 ...	1,371	1,058	1922 ...	738	574
1918 ...	1,163	896	1923 ...	666	507
1919 ...	999	738	1924 ...	623	505
1920 ...	820	615	1925 ...	664	515

The present scheme for the treatment of tuberculosis in the county borough of Dublin only commenced in 1913. The number of cases occupying (with family) one, two, or three or more rooms was: one room, 746; two rooms, 319; three rooms or more, 229. This shows the effect of bad housing on the spread of the disease. Notifications of the disease decreased between 1916 and 1923, but in 1924 and 1925 there were sharp increases. The figures were:

1916 ...	750	1920 ...	583	1923 ...	505
1917 ...	761	1921 ...	527	1924 ...	701
1918 ...	814	1922 ...	511	1925 ...	690
1919 ...	734				

It is well known that among the poorer class and in congested areas the disease is more prevalent than in the outlying districts, and this is clearly demonstrated by the figures for last year, which show 1.45 deaths per 1,000 in the urban districts, compared with 1.98 in the city. Portions of the north side of the city are, and have always been, the most generally affected.

Correspondence.

A MEDICAL ASPECT OF MINERS' SHORTER HOURS.

Sir,—In addition to wages and hours there is another factor in connexion with the strike which seems to have been overlooked: I refer to the human factor, as one which cannot but be of great interest from the medical point of view.

Under the nine-hour day the miners worked steadily and quietly, and always had a reserve of power wherewith to make, if necessary, an occasional spurt; under the eight-hour day that reserve was reduced considerably, whilst under the seven-hour day not only was there no reserve, but at the end of the shift the men (and I refer to the good workers) were exhausted.

Previously the men used to partake of food when underground, but under the seven-hour day they worked the whole stretch without any stop for food. Even had they stopped, the pace at which they had to work was such that their digestions were likely to suffer. Conditions such as these are not calculated to improve the physical or mental health of the men; in fact, the reverse is the case, as is evidenced by the smallness of the number of colliers at work over 50, compared with the large number of those over 60 who used to carry on under the old conditions.

The men, when they reach the age of about 50, look out for day-work as they cannot stand the strain of piece-work, and, as far as I can gather, this is due to their hearts being more or less seriously disturbed.

That workers in the prime of life and full of working experience should be obliged to give up is a matter of great national and economic importance, and should be properly investigated. Collected data showing whether or no there is an increase of heart trouble in colliers, and more particularly in those over 50, during the last ten years would be invaluable. Personally my experience is that colliers' hearts are not so good as they used to be, owing to the speed at which they work. It would also be interesting to know if this pace has something to do with the greater nervous upset of the men, as shown, for example, by the increasing number of cases of nystagmus which are brought into court for compensation.

The method of working the coal has altered during the last few years. Formerly a man of 50 (or more) and his son used to work a "heading" together on their own; but to-day a large number of men at the facings work on the conveyer system, and pool their earnings, with the result that the young men are always gibing at their elders because the latter cannot keep up the speed. Under the old system a man could miss a day and make up by a little extra speed on the other days of that week. Under the seven-hour day there is no chance of making up, and consequently no opportunities for getting days off.

All these things have an important bearing on this national industry, and whatever there is of truth in connexion with them should be brought to light, apart altogether from the political aspect of the matter.—I am, etc.,

Swansea, Nov. 2nd. G. Arbour Stephens.

GOOD AND BAD DIETS.

Sir,—As one interested in the diet of children I would like to express my appreciation of Dr. Harry Campbell's letter (October 30th, p. 808). It is very true, as he points out, that we owe a considerable debt to physiologists like Colonel McCarrison for putting the various diet deficiency diseases on a scientific basis. At the same time it must be realized that all their findings boil down to the fact that these diseases are caused by unnatural diet and unnatural circumstances—that is, diet and conditions entirely different from those in which the animal evolved. The experience of zoological gardens bears this out, and it is a fact that the less it is possible to feed an animal or bird in captivity on its natural food, the less will be its chance of survival for any length of time. Another fact that emerges from both animal experiments and the experience of zoological gardens is that the young animal and bird are much more susceptible to an unnatural diet than adults.

The diet on which man evolved is largely a matter of surmise. My own view is that he was very largely carnivorous and lived on the flesh of the beasts he hunted, the birds he trapped, and the fish that he caught, eked out when times were bad with fruit berries, roots, and the like. What, then, was the diet of the pre-agricultural baby? At first breast-fed; as soon as it became mobile this must have been supplemented by the food of its parents, like the young of any mammal in its natural state. The infantile instinct of "putting things into the mouth" is deeply rooted, and no great stretch of imagination is required to picture the Neanderthal baby sitting at the mouth of its parents' cave sucking the meat off a horse-bone.

How far nowadays is the average well-to-do infant's diet from this, the natural one? I do not refer to those homes in which there are economic difficulties. It may or may

It would appear, then, that this complaint, with its high mortality, was diphtheria It is not stated whether Dr. Turnbull's application to the soles of the feet was intended to draw the lights down again!—I am, etc.,

London, N.W.5, Oct. 30th. P. P. DALTON.

THE PREVENTION OF SCARLATINAL NEPHRITIS.

SIR,—In the excellent summary of my address to the Ulster Medical Society on "The constitutional factor in disease," which appears in your issue of November 6th (p. 853), the names of the authorities I quoted in support of my views are omitted by the reporter. I am anxious to draw attention to the fact that the underlying diathesis which predisposes to acute nephritis, and the means I described whereby this serious complication can be completely prevented in scarlet fever, are the discovery of Dr. A. A. Osman. His work, which constitutes what I believe to be one of the most important advances in public health of recent years, is still unpublished, but he has briefly summarized in it a paper which will appear in the forthcoming October number of the *Guy's Hospital Reports*.—I am, etc.,

New Lodge Clinic, Berks, Nov. 7th. ARTHUR F. HURST.

Medico-Legal.

TWO MEDICAL MEN CHARGED WITH CRIMINAL ABORTION.

THE preliminary magisterial hearing of the case against Dr. Arthur Stuart Holden of Preston, and Dr. Frederick Langton Webster of Bamber Bridge, near Preston, on charges of feloniously causing the death of Miss Norah Marmion, aged 24, the daughter of a Penmaenmawr quarry owner, at Bamber Bridge on October 7th, while performing an illegal operation, and on other charges of using an instrument and of conspiring together with the dead woman for the alleged purpose, commenced before the Bamber Bridge justices on November 5th and 8th. It was announced that the charges of aiding and abetting which had been preferred against Major W. Blackburne and Mrs. Blackburne and Mrs. Holden would be withdrawn.

The proceedings at the inquest on the deceased woman, which terminated in the two doctors being committed for trial at the next Manchester Assizes on a charge of murder, the other three accused persons being committed as accessories, were briefly reported in the last issue of the BRITISH MEDICAL JOURNAL, at page 860.

Case for the Prosecution.

Mr. Laski, counsel for the Crown, in his opening statement, said that prior to this unfortunate occurrence, the deceased woman was taken out a good deal by a Mr. Alexander French of Waterloo and a Mr. James Allman of Great Crosby, the latter of whom went abroad some months ago. The deceased woman was engaged to be married to Mr. Allman two years ago, and she had also been engaged to be married to a doctor from July, 1925, to July, 1926. It would be given in evidence that she had intimacy with both Mr. French and Mr. Allman. On September 1st, 1926, she visited her sister, Mrs. Blackburne, at Preston. During the visit she met Mr. French and informed him of her condition, and, in consequence, he offered to marry her, but she refused him. On October 5th the deceased woman called at Dr. Holden's surgery, and on October 8th she went with Dr. Webster, Dr. and Mrs. Holden, and Major and Mrs. Blackburne to the theatre, and afterwards on to Dr. and Mrs. Holden's house for refreshment. The following evening a visit was paid to Dr. Webster's house ostensibly to play bridge, but, in the view of the prosecution, an illegal operation was performed by one or other of the doctors, Miss Marmion dying from shock.

Evidence was then called.

Mr. Peter Marmion, the deceased's father, said he did not at the time think there was anything unusual about his daughter's visit to her sister.

Mr. Alexander French, aged 23, employed by a firm of sanitary engineers at Liverpool, said he first became acquainted with Miss Marmion when living at Waterloo about five or six years ago. He took her about a great deal, but he had never been engaged to her. He saw her twice on her last visit to Preston, the last occasion being when he saw her off at the station on October 4th last. He also saw her at Southport two days earlier, when she made a certain communication to him, and, in consequence, he offered to marry her, but she refused him. She did not allege that he was the cause of her condition, although, in fact, there had been intimacy between them. He first heard of her death on the morning of October 8th, when Major Blackburne informed him over the telephone. He then went to Preston, saw Major Blackburne, and asked what had happened. Major Blackburne replied: "It's very terrible. All I can say now is that Norah died last night." When he saw Mrs. Blackburne earlier she said that Norah had died, but that she did not really know what had happened, adding, in reply to his questions, that that was the first she had heard of her sister's condition.

The Conspiracy Charge.

An objection by Mr. G. Ambler, solicitor, who appeared for Major Blackburne, against the admission of evidence of events prior to Miss Marmion's death was recorded by the court, but counsel pointed out that there was a charge of conspiracy against two of the defendants.

Mrs. Elizabeth Rome of The Grange, Euxton, said on October 7th she lunched with Mrs. Blackburne and Miss Marmion at Major Blackburne's residence, and later had tea with Major Blackburne and her own husband, she and her husband leaving at 5.45 p.m.

A further objection to a question tending to elicit what Miss Marmion said in the presence of Mrs. Rome and Mrs. Blackburne as to what she was going to do that night was recorded by the court, though it was allowed, counsel again pointing out that the answer formed part of the case of alleged conspiracy of the two doctors with Miss Marmion. Mrs. Rome then stated that what Miss Marmion said was that she was going that evening to play bridge at Dr. Webster's, and that Dr. and Mrs. Holden and Major and Mrs. Blackburne were going too.

Dr. Holden's Alleged Statement.

Police-Inspector Blenkinsop of Bamber Bridge said Dr. Holden came to his house at 1.45 a.m. on October 8th, and informed him of Miss Marmion's death at Dr. Webster's house under an anaesthetic during an operation. Dr. Holden also said that the girl was expecting to become a mother. Following a remark by the witness, Dr. Holden replied: "I have let Dr. Webster in. She was my patient."

Cross-examined by Mr. Lustgarten, for Dr. Holden, the witness said after his interview with Dr. Holden he wrote on a slate: "Staying temporarily with Dr. Holden. I have let Dr. Webster in. She was my patient," and other matters. He had allowed the writing to be rubbed off the slate since.

Questions were put to this witness tending to show that his evidence was unreliable, and, later, Detective-Inspector Fenton of the Lancashire Constabulary admitted, in cross-examination, that the police-inspector was not suffering from worry alone, but the Bench, after consideration in private, decided that this witness should not be required to answer the question whether Inspector Blenkinsop had attempted to commit suicide.

Inspector Fenton further said that when he arrested the accused doctors, Dr. Holden and Dr. Webster replied that they were not guilty of the charge of causing Miss Marmion's death by an illegal operation. When further jointly charged with the offence, and also with conspiring with the deceased in its committal, each denied his guilt.

The Medical Evidence.

Dr. W. A. Simpson of Bamber Bridge, acting police surgeon, who conducted the *post-mortem* examination on October 9th in the presence of both accused and four other doctors, gave his findings in detail. He came to the conclusion that death was probably due to asphyxia following the administration of an anaesthetic acting on a fatty heart. He found circumstances which led him to think that an instrument had been used, but he did not find any sign of an instrument having been used. He based his opinion as to the cause of death on the statement said to have been made to Police-Inspector Blenkinsop by the two accused doctors that an anaesthetic had been used. Cross-examined, the witness said his examination of the uterus did not go far enough to enable him to tell definitely whether or not the deceased woman was pregnant.

Dr. K. M. Duncan of Preston, senior police surgeon for Lancashire, who also was present at the *post mortem*, concurred with the findings of the previous witness, but he differed as to the actual cause of death, which, he said, he found difficult to give with any certainty. He did not think it sufficiently evident that there had been asphyxia, and thought the condition of the body more consistent with death from shock. He detected no trace of an anaesthetic.

Sir Bernard Spilsbury detailed the results of his examination of organs sent him. His definite opinion was that death was due to shock consequent upon the passing of an instrument used for the purpose of procuring abortion. He detected no trace of an anaesthetic, and he would have expected to detect an odour. There was evidence that artificial respiration efforts had been made for some time after death. The stomach was dilated and empty, and he would not expect to find this under ordinary conditions at the time when the woman died—which he put at between 9 and 10 p.m. He also came to the conclusion that an ovum was removed from the body after death. It was customary to have the stomach empty in preparation for an operation such as he believed had taken place. Cross-examined, Sir Bernard Spilsbury said, in his opinion, death occurred certainly within five minutes of the passing of the instrument. Before examining the organs he had received a copy of Police-Inspector Blenkinsop's statement.

The accused medical practitioners pleaded not guilty, reserved their defences, and were committed for trial at the next Manchester Assizes.

Bail was refused.

claimed that the first accurate description of the anatomy of the cardinal ligaments was published by the late Arthur Nyulasy in 1914.—I am, etc.,

Frank A. Nyulasy, M.D.

Melbourne, Australia, Sept. 5th.

LEAD AS AN ABORTIFACIENT.

Sir,—Some time ago, in country practice, I had a message from a neighbour asking me to see with him a case of acute abdominal disease. The history was this: A robust young woman (married three months) had had pain in the stomach a few days previously, and again on the day before, when she was first seen. On inquiry her doctor was informed that she was regular every month. Next day she was fairly well till after tea, when she had agonizing pain and urgent vomiting, which continued till I arrived, about four hours later. Nothing definite was made out till rectal examination revealed an enlarged uterus; on vaginal examination it corresponded to a three months' pregnancy, and the state of the breasts confirmed this. Thinking it strange that she had been misleading everyone, I looked at her gums and found a blue line. Morphine followed by a course of mistura alba was successful. She went to full time without any bad result. She never revealed the truth.

Some years after, in London, I had another case, which may be summed up thus: (1) Colic and vomiting; headache, albuminuria, constipation; (2) blue line on gums; (3) anaemia slight, yet films showed brisk pathological regeneration culminating in punctated erythroblasts and leucoblasts. Such a film is pathognomonic of lead poisoning, and the woman (married with three children) admitted that she had taken lead lotion because she had missed her period. She was very ill for some days, requiring morphine on several occasions. After a few weeks on mistura alba she was quite well. Three months from the beginning of her illness the conspicuous blue line had quite disappeared, the blood film was normal, albuminuria had gone, and pregnancy was well advanced. A small but healthy girl was born six and a half calendar months from the beginning of the illness. As the woman gave every information, I found that she had taken 60 grains of lead acetate in a fortnight.

This case proves that even marked blue lines may disappear within three months of treatment. In a series of cases in 1922 (British Medical Journal, January 20th, 1923, p. 103) I found that in about three months blood films became normal and lead disappeared from the urine. In recent cases, therefore, all three disappear together.—I am, etc.,

Ealing, W.13, Oct. 25th. Robert Craik.

CLOTHING AND CATARRHS.

Sir,—In the *Daily Express* of November 1st is an article, announced as one of a series by famous physicians, on "Why have a cold?" by Dr. Leonard Williams.

He advocates the avoidance of excessive warm clothing, and I am not concerned with this contention. What interests me is the remarkable hypothesis which he uses to support it. He considers that the respiratory function of the skin is impeded by too much clothing, thereby throwing so much more work on the lungs and "air passages" that they soon "tire" and become liable to microbic infection.

Dr. Williams must be aware that the respiratory function of the skin in man is so small as to be almost negligible. Next there is no reason to suppose that increased respiration by the lungs lowers their resistance—or why do we advise people to take exercise? Lastly, the respiratory function of the skin is undoubtedly increased by hyperaemia and sweating, while ordinary clothes freely permit the interchange of gases so that its respiratory function, such as it is, is presumably increased by warm clothing.

I can only conclude that this hypothesis was introduced to give a scientific flavour to the article, and that it is not one which Dr. Williams would be prepared to maintain seriously amongst medical men, and this is my reason for writing this letter.

In the same newspaper there have recently been articles by eminent men of science on such difficult subjects as relativity and the structure of the atom. All the writers have shown the utmost care to preserve accuracy of statement in a popular article, and to me the contrast with this sort of thing is most unpleasant.

I think for the credit of our profession that those who are now taking to medical journalism should endeavour to act up to the popular idea that they are also scientific men.—I am, etc.,

Dover, Nov. 3rd. A. R. Jordan, M.D., F.R.C.S.

MEDICAL PRIVILEGE IN THE COURTS.

Sir,—I was interested in the letter of Dr. L. A. Parry on "Medical privilege in the courts," published in the Journal of October 9th (p. 665). I note that Lord Mansfield stated, "If a surgeon was voluntarily to reveal these secrets, to be sure he would be guilty of a breach of honour, and of great indiscretion." The secrets referred to are secrets of a patient entrusted to the medical man by virtue of his position as professional attendant.

I take this opportunity of stating that about two years ago I was called professionally to attend a woman who had been stabbed in the thigh by her husband a few days previously. The wound was healing excellently owing to the very able treatment given by the assailant, an ex-R.A.M.C. man. There was no danger whatever to life. I told the wife that she would be well advised to inform the police, her husband being present on the occasion. The wife indignantly refused to do so, telling me that she had forgiven her husband, and added that if he should go to prison she would lose the advantage of a pension that he was receiving. Consequently I let the matter rest. Ten days later the husband once again assaulted the woman, and the police were notified and the previous assault was mentioned.

The man was tried at Lewes Assizes in December, 1924. I was subpoenaed and gave evidence. The judge, Mr. Justice Swift, asked me to give my reason for not having informed the police of the original offence. I answered, "I did not and do not consider that I was under any legal obligation to do so." Mr. Justice Swift, with anger, replied, "No, it was not your legal obligation, but it was your moral obligation, and I consider it was most regrettable that you did not inform the police. It is the duty of every good citizen to inform the police when he becomes aware that a crime has been committed."

I should be glad to know if the learned judge was correct in his observations.—I am, etc.,

Brighton, Oct. 9th. W. E. Levinson.

"RISING OF THE LIGHTS."

Sir,—With reference to the term "rising of the lights" given as a cause of death in the Bills of Mortality quoted in the article ("Nova et Vetera") in your issue of October 9th, and the suggestion that this may refer to emphysema, the following passages, quoted from *Domestic Medicine, or a Treatise on the Prevention and Cure of Diseases*, by William Buchan, M.D., Fellow of the Royal College of Physicians, Edinburgh, printed in London, 1798, are of interest.

"Of the Croup.

"Children are often seized very suddenly with this disease, which, if not quickly relieved, proves mortal. It is known by various names in different parts of Britain. On the east coast of Scotland it is called the croup. On the west they call it the chock or stuffing. In some parts of England, where I have observed it, the good women call it *rising of the lights*. It seems to be a species of asthma attended with very acute and violent catarrhal symptoms.

"It is attended with a frequent pulse, quick and laborious breathing, which is performed with a peculiar kind of croaking noise, which may be heard at a considerable distance. The voice is sharp and shrill, and the face is generally much flushed, though sometimes it is of a livid colour. . . .

"Dr. William Turnbull, in London, a physician of great experience, observes that he never found blistering of any service; but recommends cataplasms of garlic, camphor, and Venice treacle, to be applied both to the throat and soles of the feet."

Obituary.

F. M. CAIRD, M.B., C.M., F.R.C.S.E., LL.D.,

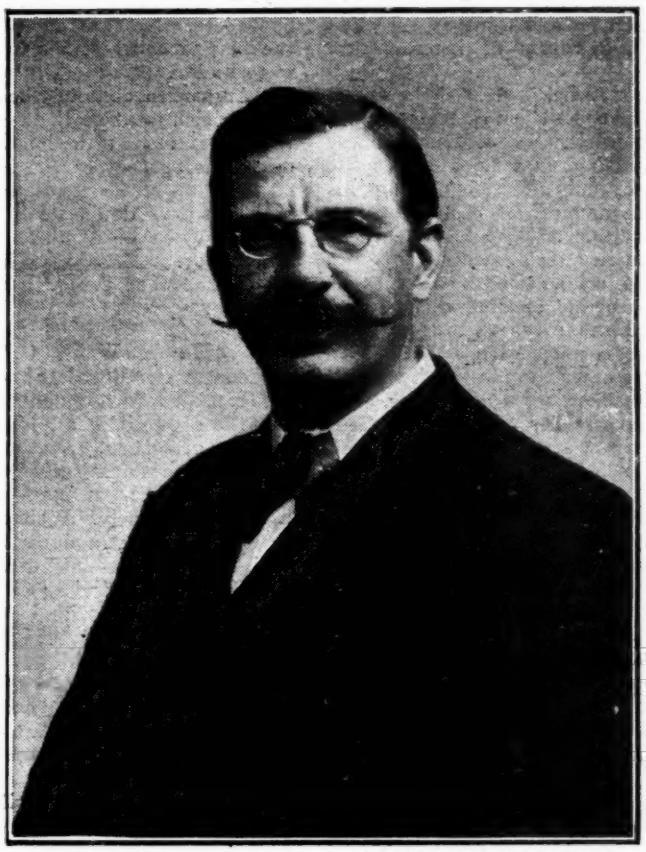
Emeritus Professor of Clinical Surgery, Edinburgh University.

WE announced briefly in our last issue the death on November 1st, in Edinburgh, at the age of 73, of Emeritus Professor Francis Mitchell Caird. Although he had had a few signs of cardiac weakness in recent years, his death took place with startling suddenness while he was in full mental and bodily activity. He was born in 1853, and was educated at the High School, and thereafter assisted the late Professor John Hutton Balfour in the Botanical Department of the University, and at a later stage adopted medicine as a career. He graduated M.B., C.M. at Edinburgh in 1877. As Lister had been professor of clinical surgery up to the preceding year, Caird came greatly under his influence, having served both as a dresser and clinical clerk in his wards. This to a great extent determined his career, for, having an ardent love for surgery, he began to devote himself to preparations for work as a surgeon almost immediately after graduation. In the summer session of 1878 he became resident in the surgical wards of Mr. Chiene. In 1879 he took the diploma of L.R.C.S.Edin., and proceeded to the Fellowship in 1880. Caird thus became the living transmitter of the Listerian doctrines and practice in Edinburgh, and these were well summed up in a pamphlet entitled *Hints on the Antiseptic Management of Wounds, "Listerism,"* which he published in 1880.

With the object of gaining a fuller knowledge of pathology and anatomy he went to the University of Strasbourg, where he studied especially under von Recklinghausen and Joessel. On his return to Edinburgh he was demonstrator in anatomy for some three years at Minto House and in Surgeons' Hall under Dr. (later Professor) Cossar Ewart and Mr. C. W. Cathcart. At the same time he was invited by Professor Chiene, who at that time was one of the ordinary surgeons to the Royal Infirmary, to become his private assistant. In this capacity he not only assisted Mr. Chiene in his private surgical practice, but helped him in the teaching of his large surgical class. This position he continued to hold until 1886; when Mr. Chiene was appointed professor of surgery in succession to Professor Spence, in the year 1882, Caird became the University assistant in the chair of surgery. In 1886 Mr. Caird was elected to the post of assistant surgeon to the Royal Infirmary of Edinburgh, and commenced to lecture on his own account in surgery as a recognized extra-mural teacher; for the next twenty years he continued to lecture with success on this subject, attracting large classes of students. He was distinguished for great clearness of exposition as well as forcefulness and brevity of expression, qualities which rendered him highly popular as a teacher. In 1900 he was appointed to full charge of wards in the Royal Infirmary, and here as a clinical teacher his popularity was even greater.

In 1908, following upon the death of Professor Annandale, he was elected to fill the Regius Chair of Clinical Surgery in the University of Edinburgh, a post which he held till 1919, when he resigned and was succeeded by Sir Harold Stiles. On his retirement from this post he received, in 1920, the honorary degree of LL.D. from the University, and at the same time was elected by the managers of the Royal Infirmary a consulting surgeon to that institution.

At an early stage in his career Professor Caird had been greatly influenced by the work of some of the Continental surgeons, particularly of Professor Mikulicz of Breslau, and almost every summer he paid a visit to one or more of the great Continental medical schools, especially in Germany, where he came into personal contact with some of the eminent men by whom surgical science was being advanced. In this way he was one of the first to practise various operations in Scotland. Following his original master, Lister, he was an early upholder of the systematic use of rigorous aseptic methods. The early introduction of local and spinal anaesthesia in major operations at Edinburgh was also largely due to him. While still an assistant surgeon to the Royal Infirmary he had been greatly impressed by the advances taking place in German hospitals in regard to abdominal surgery. Billroth in Vienna had been the first, in 1881, to remove the pylorus successfully for cancer of the stomach, and during the years 1878 to 1883 had been a pioneer in performing a large number of intestinal resections and enterorrhaphies. Influenced by this work, Caird was performing gastric and intestinal operations at an earlier date and on a larger scale than any of his colleagues in Edinburgh. The results of this work were presented in various papers, published mainly in the *Scottish Medical and Surgical Journal*; among the subjects were operation for stricture of the large intestine (1901), enterectomy for tuberculous stricture of the intestine (1904), and operation for perforated gastric ulcer (1905). In 1906 he published in the Medico-Chirurgical Society's *Transactions* a series of cases of operation for perforated gastric and duodenal ulcer. He was also one of the earliest and most successful operators in the domain of excision of the rectum for carcinoma, and published a paper on the subject in 1903; his outstanding position in this department of surgery was recognized by his being invited in 1913 to deliver on it the William Banks Memorial Lecture at the University of Liverpool. Still another department of operative surgery in which he was a pioneer was excision of the tongue for cancer, and in 1911 he published a record of his work in the Medico-Chirurgical Society's *Transactions*.



Photograph by] [*A. Swan Watson, Edinburgh.*

PROFESSOR F. M. CAIRD.

Although Caird was recognized as possessing special ability and special interest in the domain of surgery of the alimentary tract, his opinion and his skill were no less valued by his colleagues in general surgery. In regard to the surgery of the limbs, he had published a valuable monograph on *The Shoulder Joint in Relation to Certain Dislocations and Fractures* as early as 1886. Professor Caird was joint author with Mr. C. W. Cathcart of *A Student's Atlas of Bones and Ligaments* and *A Surgical Handbook*, both of which have enjoyed a great measure of success. The latter especially found much favour with students, and has been the constant companion in practice of many general practitioners.

Medical Notes in Parliament.

[From our Parliamentary Correspondent.]

Parliament reassembled on November 9th, and the House of Commons commenced the Report stage of the Electricity Bill, which was expected to last most of the week. Replying to Mr. Clynes, Mr. Baldwin gave a long list of bills which the Government hopes to carry into law before the session ends. Among these were the Housing of Rural Workers Bill, Mental Deficiency Bill, Prisons (Scotland) Bill, London University Bill, Judicial Proceedings Bill, Lead Paint Bill, Legitimacy Bill, Smoke Abatement Bill, Coroners Amendment Bill, and Births and Deaths Registration Bill. The Prime Minister added that no progress would be attempted this session with the Factories Bill.

In the House of Lords on the same day the Earl of Plymouth, replying to Lord Astor, said the new Factories Bill did not give special measures of protection to juveniles between 14 and 18 years of age in occupations not at present regulated by Statute. He did not think the bill could be amended to include them. Legislation on the matter would be premature until the conditions and hours of labour of young persons employed in factories had been settled.

University of London Site.—In reply to a question by Sir W. Davidson as to grants promised to the University of London, the Chancellor of the Exchequer said that he had promised in June that the Government would be prepared, within certain financial limits, to ask Parliament to make provision for improved accommodation for the University of London, subject to the approval by the Treasury of plans to be formulated by the Senate. The offer was not limited to a South Kensington or a Bloomsbury site. [The action of the Senate is mentioned below.]

Inspection of Dairy Farms.—In reply to a question on November 9th, the Parliamentary Secretary to the Ministry of Health said that fresh legislation to amend the Milk and Dairies (Consolidation) Act, 1915, was not contemplated. The proposal that all medical officers in any urban district to which milk was supplied should have the right to inspect the farm from which such supplies came would therefore not at present be considered. In reply to another question, he said that the Ministry saw no reason for exempting from the requirements of the Order farmers who sold milk only to farm workers and their families.

Notes in Brief.

The Secretary for India has recently sanctioned a scheme which will provide certain passage facilities for Indian officers of the Indian Medical Service who desire to study in this country.

In reply to a question as to the increase of imports of condensed machine-skimmed milk, Sir Kingsley Wood said that the regulations required every tin of such milk to be labelled "Machine-skimmed" and "Unfit for babies."

The question whether the addition of certain chemical substances to flour, with the object of modifying its baking properties, was objectionable on grounds of health and what restrictions, if any, should be placed on it, has been referred to a Departmental Committee.

Universities and Colleges.

UNIVERSITY OF LONDON.

Dr. R. D. Lawrence has been recognized as a teacher of chemical pathology at King's College. Dr. Percy Stocks, University Reader in Medical Statistics at University College, has been admitted to the Faculties of Medicine and Science.

The University medal in Branch VI (Tropical Medicine) of the M.D. examination for internal and external students, July, 1926, has been awarded to Richard M. Morris, B.S., of the London Hospital and the London School of Tropical Medicine. A grant of £150 from the Thomas Smythe Hughes Fund has been made to Miss Kathleen Chevassut, B.Sc., to defray the cost of apparatus in connexion with her research on glycolysis in cerebro-spinal fluid.

The examinations will commence on April 19th and June 28th, 1927, for fourteen medical entrance scholarships and exhibitions of an aggregate value of £1,513 tenable in the Faculty of Medical Sciences of University and King's Colleges, and in the medical schools of King's College Hospital, University College Hospital, the London Hospital, and the London (Royal Free Hospital) School of Medicine for Women. Full particulars and entry forms may be obtained from the Secretary of the Board, Mr. S. C. Ranner, M.A., the Medical School, King's College Hospital, Denmark Hill, S.E.5.

Subject to the consent of the Chancellor of the Exchequer to proposals put forward by the University, the Senate has authorized definite negotiations with the Duke of Bedford for the purchase of part of the Bloomsbury site.

UNIVERSITY OF CAMBRIDGE.

H. W. Florey, M.B.Adelaide, has been elected to an official Fellowship at Gonville and Caius College for his physiological researches. After graduating in medicine at the University of Adelaide in 1920 he entered Magdalen College, Oxford, as a Rhodes Scholar. In 1924 he became a member of Caius College on election as John Lucas Walker student in pathology, and in 1925 he was elected to a Rockefeller Research Fellowship.

UNIVERSITY OF BIRMINGHAM.

The Council of the University of Birmingham has decided to ask the Court to confer the title of Emeritus Professor on Professor O. J. Kauffmann, M.D., Joint Professor of Medicine in the University from 1913 to 1926.

Dr. T. L. Hardy, Assistant Physician to the General Hospital, has been appointed assistant to the chair of medicine; and Dr. C. C. W. Maguire, Physician for Out-patients at Queen's Hospital, has been appointed honorary demonstrator in the department of anatomy.

NATIONAL UNIVERSITY OF IRELAND.

The following degrees were conferred at a meeting held in University College, Cork, on November 2nd:

M.D.—M. Whelton.
M.Ch.—J. Kiely.
M.B., B.Ch., B.A.O.—J. F. Carr, E. Egan, Annie A. O'Connor, M. Ahern, A. Callaghan, T. F. Crowley, D. Duggan, D. McCarthy, D. F. McCarthy, J. L. MacSweeney, D. Mahony, F. D. Murphy, M. A. Neville, D. O'Connell, M. O'Donnell, J. O'Driscoll, D. J. O'Sullivan, E. T. O'Sullivan, J. M. Quinlan, T. Richardson, J. Roche, E. J. M. Scanlan, J. Scott.
D.P.H.—M. Harris-O'Connor, E. T. Callanan, W. J. O'Donovan.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

A quarterly meeting of the College was held on November 2nd, when the President, Dr. George M. Robertson, was in the chair.

Dr. L. S. P. Davidson and Dr. W. E. Foggie took their seats as Fellows of the College. Dr. R. G. Gordon (Bath), Dr. J. R. Drever (Edinburgh), Dr. A. L. S. Tuke, *M.C.* (Dunfermline), and Dr. J. F. Christie (Aberdeen) were elected Fellows of the College.

The Hill Pattison-Struthers bursaries in anatomy and physiology and in clinical medicine were awarded to H. G. Somerville and H. B. Martin respectively. The Wood bursary was awarded to J. P. Collie.

The licence of David William Anderson, which had been suspended on May 5th, 1925, was restored.

At an extraordinary meeting of the College held on the same date the licences of Edalji Jamshedji Treasuryvala, Bombay, and Kaikhushru Edalji Master, Bombay, were suspended *sine die*.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

At the monthly business meeting of the College, held on Friday, November 5th, the following candidate, having passed the necessary examination, was duly admitted a Member of the College: Shafik Abd-El-Malek Fam, M.R.C.S.Eng., L.R.C.P.Lond.

The Services.

TERRITORIAL DECORATION.

The Territorial Decoration has been awarded to the following officers of the Royal Army Medical Corps, Territorial Army: Majors William Cooper Gunn, Robert Harvey, and Frederic Edwin Hubert Keogh.

NO. 14 STATIONARY HOSPITAL.

The seventh annual dinner of the medical officers of No. 14 Stationary Hospital will be held on Friday, December 10th, at the Trocadero Restaurant, Piccadilly, at 7.45 p.m. Lieut.-Colonel J. R. Harper, C.B.E., will be in the chair. The price of the dinner will be 15s. (exclusive of wines). The honorary secretary is Dr. H. L. Tidy, 39, Devonshire Place, W.1.

DEATHS IN THE SERVICES.

Lieut.-Colonel Thomas James Paul Holmes, R.A.M.C.(ret.), died at Hove on October 21st, aged 81. He was born on October 23rd, 1844, the son of the Rev. J. P. Holmes, rector of Gallen, King's County, and was educated at Trinity College, Dublin, where he graduated M.B. in 1866, taking also the L.R.C.S.I. in the same year. He entered the army as assistant surgeon on April 1st, 1867, attained the rank of brigade surgeon lieutenant-colonel on May 3rd, 1893, and retired on April 7th, 1897. After his retirement he was employed at Kingston from 1897 to 1902.

Major William Wallace Boyce, D.S.O., R.A.M.C., died suddenly in London on October 31st, aged 43. He was educated in Dublin in the school of the Royal College of Surgeons, and took the L.R.C.S.I. and L.R.C.P.I. in 1905. He entered the R.A.M.C. as lieutenant on July 30th, 1906, and reached the rank of major on January 28th, 1919. He served throughout the recent great war, was thrice mentioned in dispatches, and received the D.S.O. on March 8th, 1919.

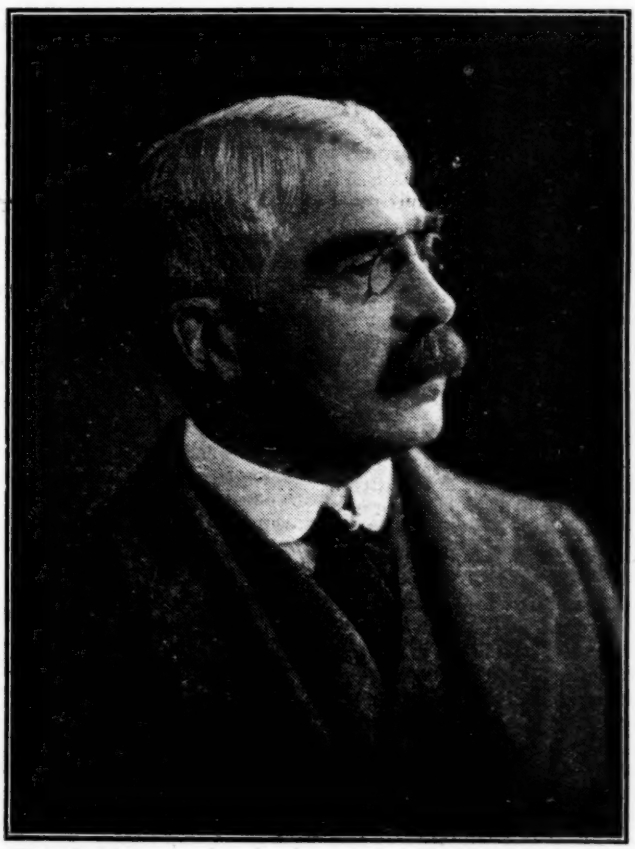
Captain George Cuthbert Robinson, R.A.M.C., died in a nursing home, from illness the result of active service, on October 18th, aged 33. He was born on December 21st, 1892, the son of Surgeon-Lieut.-Colonel G. S. Robinson, Scots Guards, and was educated at St. Thomas's Hospital, taking the M.R.C.S. and L.R.C.P.Lond. in 1916. He joined the R.A.M.C. as a temporary lieutenant on February 8th, 1916, took a permanent commission from January 1st, 1917, became temporary captain, after a year's service, on February 8th, 1917, and was confirmed in that rank from August 8th, 1917. He served throughout the war from 1916 on.

WILLIAM EDWARD FOTHERGILL, M.A., M.D.,

Professor of Clinical Obstetrics and Gynaecology, Manchester University; Senior Surgeon for Women, St. Mary's Hospitals, Manchester; Consulting Gynaecological Surgeon, Manchester Royal Infirmary.

It was a great shock to his many friends to hear of the sudden death of Professor W. E. Fothergill, at the early age of 61, when he seemed to be enjoying excellent health and undiminished energy. He attended the annual dinner of the Glasgow graduates on November 4th, and was apparently in his usual buoyant spirits. After making a speech he complained of feeling ill, and when attempting to leave the room collapsed and died a few minutes later in the ante-room.

William Edward Fothergill was born in 1865 at Darlington. He came of an old Quaker family in direct descent from the elder brother of the famous eighteenth century Quaker physician Dr. John Fothergill. At the age of 17 he was sent to the University of Edinburgh, where he had a very distinguished career, graduating in the first place in arts, then in science, and finally in medicine, taking the degree of M.B. in 1893 with first class honours, and the Buchanan Scholarship. In 1897 he proceeded to the M.D. degree, which he obtained with first class honours and the gold medal; later he was awarded the Milner-Fothergill gold medal. After a period of study in Jena and Paris he returned to Edinburgh, and held resident posts in the Edinburgh Royal Infirmary and the Royal Maternity Hospital. He was then appointed assistant to the professor of obstetrics, Sir Alexander Simpson.



Photograph by] [Lafayette, Manchester.

Professor W. E. Fothergill.

He had now decided to devote his life to obstetrics and gynaecology, and as Edinburgh seemed to be overcrowded, he looked around for a new sphere of action, and decided upon Manchester. To most people it would have seemed a hopeless task for a young man without a claim on any of the local hospitals to carve a position for himself, but by sheer dogged determination and his ability to make himself useful and indispensable to senior men he not only did this, but eventually obtained the highest appointments in this branch of medicine in his adopted city.

He was a skilled pathologist and a good artist, and this stood him in good stead in his early days, as he helped many of the senior men to describe and illustrate cases which they wished to publish; moreover, he established the first clinical laboratory at the Manchester Royal Infirmary.

He was soon appointed assistant lecturer to the professor of obstetrics, Sir William Sinclair, and later was put on the staffs of both the Southern Hospital and the Northern Hospital as assistant surgeon for women. In these early days he published his well known *Manual of Midwifery*, which was used extensively in Manchester, Edinburgh, and other centres. Some years later the Southern Hospital was amalgamated with St. Mary's Hospital, and he became assistant surgeon to the combined hospitals; soon afterwards he was appointed assistant gynaecological surgeon to the Manchester Royal Infirmary.

At the university he held successive appointments for thirty years, first as assistant lecturer, then full lecturer, and finally, in 1920, was elected to the chair of systematic obstetrics and gynaecology, which he exchanged for the chair of clinical obstetrics and gynaecology in 1925.

In these hospital posts, which he held for so many years, Fothergill acquired a large clinical experience and was recognized as a sound diagnostician and operator, but probably his greatest asset was his command of the English language and his ability to express himself both in speech and writing. Often has it happened at a board meeting when some subject had been discussed at length and agreement in principle finally reached though no one was able to find the exact words to express it, Fothergill would take a piece of paper and without hesitation write down the exact formula all had striven for in vain. This ability of easy expression stood him in good stead, and he poured out a steady stream of writing which contained good, sound material, expressed in language easy to understand and delightful to read. Reference has already been made to his textbook on midwifery; at a later date he wrote a companion volume, a *Manual of Diseases of Women*, and published in a volume a series of lectures to midwives and maternity nurses; all ran into many editions. This gift was unstintingly placed at the disposal of any of his younger colleagues, and many of these, of whom the writer is one, gratefully acknowledge the help and instruction he so lavishly gave when they were preparing their first papers. This facility of easy expression, combined with a wonderful memory, which supplied an apt illustration for any point under discussion, made him a brilliant and arresting teacher.

In private life Fothergill was a delightful companion; endowed with a great gift of humour and a fund of stories which suited every occasion; it was impossible to be dull in his presence, and before the death of his wife he was always seen at his best when presiding at the happy little dinner parties they delighted to give, or surrounded by a group of friends he had collected in his house after some scientific meeting. Fothergill always rebelled against conventionality, and this sometimes made him express his opinion somewhat brusquely; but behind this manner lived a kindly soul ready to see the other side when put to him quietly. His hobbies were associated with simple country life, and his holidays were always spent in unfrequented beauty spots, where he was perfectly happy studying plant and animal life or in sketching, in which both he and his wife were very proficient, and he often spoke with pleasurable anticipation to the time when he would retire to one of his beloved Yorkshire dales. Although he had no family himself he was greatly interested in young people, and never happier than when he was stimulating the undergraduates' athletic activities. As president of the students' cricket and Rugby football clubs, and lately of the athletic union, he was no mere figurehead, but was a regular attendant at all matches and the subsequent suppers; he enjoyed them as much as any youth present.

In 1895, the year he settled in Manchester, he married Edith, the daughter of the late J. Dulon Wood of Chelsea. This proved an ideal marriage, for both had the same hobbies and pleasures; they were inseparable companions.

In 1901 Professor Caird received the Victoria Liston Jubilee Prize from the Royal College of Surgeons of Edinburgh "for the greatest benefit done to practical surgery by any Fellow or Licentiate of the College during the quadrennial period ending June 20th, 1901." In 1906 he delivered the annual address on surgery to the Canadian Medical Association at its meeting in Halifax. During the great war he acted as one of the consulting surgeons to the British Expeditionary Force in France, having the rank of colonel in the Army Medical Service and being attached to the Third Army. At the last meeting of the British Medical Association in Edinburgh he was joint secretary to the Surgical Section. His interest in the Association did not diminish, and in 1915-16 he was president of the Edinburgh Branch. He was secretary of the Medico-Chirurgical Society of Edinburgh for a considerable time, and at a later date occupied the presidential chair of this society; those who attended can remember the skill with which he conducted its meetings and the admirably brief and lucid manner in which he was wont at the close of a discussion to sum up the points of interest and importance contributed by various speakers.

To the end of his life Professor Caird preserved the quiet, alert, and kindly manner which had characterized him in his relations with many generations of pupils. He was a man of tender sympathy, and had in a high degree the ability of inspiring confidence and affection among his patients. His energy and the amount of daily work he could accomplish were extraordinary. By his students he was held both in reverence and in affectionate regard, and no one ever accompanied him on a ward visit without picking up some important principle of diagnosis or prognosis or receiving some useful hints in regard to treatment. He maintained a voluminous correspondence both with foreign colleagues and with former pupils, and in this his width of interest and his memory were admirable.

Professor Caird had a great gift for delineation. This had been acquired in his early years in connexion with making sketches of plants. He had great facility with the pencil, and added to the value of his notes in surgical cases by making water-colour sketches; he has left a valuable collection of drawings and paintings illustrating cases and operations. His services in this respect were in great demand by his colleagues when some commemorative drawing or menu card for a medical dinner was required, and many ingenious and amusing drawings by him are preserved. Even the walls of his smoking-room in the house which he occupied for many years in Charlotte Square had been decorated by his hand with beautiful and vivid frescoes of scenes from ancient Egyptian life. At medical dinners and social gatherings in Edinburgh he was also a welcome guest; his talent for making amusing observations and his gift of song were in constant request.

The funeral took place at the Dean Cemetery on November 4th, and was attended by a large number of representatives from various medical bodies in the city. The pall-bearers included three sons—Dr. Karl Caird, Dr. Colin Caird, and Mr. Francis Caird. Among those present was Sir Robert Philip, President-Elect of the British Medical Association, Professor Russell, Mr. Alexander Miles, Mr. C. W. Cathcart, and Mr. Henry Wade. Professor Caird is survived by a widow, three sons, and two daughters.

The following appreciation has been received from Mr. C. W. Cathcart, C.B.E., F.R.C.S., consulting surgeon to the Royal Infirmary, Edinburgh:

It is with much diffidence that I respond to the request to add a few personal notes to the obituary record of my life-long friend, Francis M. Caird. He and I first met in the class of practical botany under Professor John Hutton Balfour in the seventies of last century. He was a demonstrator and I a student. In my efforts to cut sections of wood and leaves with a razor for the microscope, he helped me so kindly and successfully that I looked to him and to no other when any difficulties arose. Moreover, in our Saturday excursions for field botany he knew the names—popular and scientific—of all the wild flowers, and could tell us generally some interesting points about them. Before long other students besides myself used to gather from him all the information we required. At that stage his ability, courtesy, and gift for teaching became well recognized in the botany class. Soon he and I became fast friends, and we remained so to the end, when the sudden cardiac failure last week carried him to the grave. The impression he made on his friends was that of a man of great energy and outstanding ability. In addition to his purely professional studies he read widely in history and general literature, and when such subjects were raised in conversation could emphasize his points by illustrations from his well stored memory. His ready wit and sense of humour added a spice both to his teaching and general conversation. Caird as a dresser and clerk in Professor Lister's wards was one of the many enthusiastic followers of his chief. It was an important part of his training while a student to come under the spell of a man who was as great in his devotion to the poorest patient as he was penetrating in scientific research. Looking back on Caird's career, one can see that he was always on the look-out for new ideas. He assisted the late Dr. Berry Hart in making the first frozen sections to illustrate human anatomy that were undertaken in Edinburgh. As operating assistant to Dr. Angus Macdonald, who practised gynaecological surgery after Keith went to London, Caird developed much skill in this department of abdominal surgery. From this he went on to the surgery of the intestinal canal, and became one of the pioneers in Scotland in this line of work.

Others, no doubt, will refer to Caird's success as a teacher when he attained full rank in the Infirmary and University. Those who knew him in his younger days recognized that this was only the fulfilment of his early promise.

Mr. HENRY WADE, C.M.G., D.S.O., M.D., F.R.C.S., surgeon to the Royal Infirmary, Edinburgh, writes:

Mr. Caird was undoubtedly a magnificent teacher, and for these qualities all his students owed him a profound debt of gratitude. At the same time, he won from all, in addition to an admiration for his genius, a deep and abiding love for him as a man—an unsought tribute earned by him unconsciously. Who could resist his fascination? He seemed to tell you daily what a fortunate man you were to have chosen so splendid a profession; what a joy it was to render such services to humanity; how happy you must be to be so trusted, and how hard you must work to merit truly such a trust. He seemed to tell you that some day even you would get your commission as an ensign and be allowed to carry the colours, and that he knew he could trust you to guard the honour of the regiment of surgery in the fight that never ceased. In the operating theatre he was never spectacular. He seldom spoke to his assistants or students. All his conduct told you that you were there as a privileged spectator. The interest of the patient then alone was considered, however grave the operation, or however trivial the service to be rendered. Mr. Caird's standard of surgical honour was equalled by his surgical courage. Especially as the pioneer of abdominal surgery in the Edinburgh Medical School he frequently accomplished what was looked on as a surgical miracle, and these patients never forget their saviour. Although the calls of surgery were ever so insistent and ever met, Mr. Caird never failed to find time for other interests. The secret of how this was achieved was revealed to those privileged to assist him in his private practice. The tedium of the long train journey to a consultation was lessened by a volume of his favourite Carlyle's *Frederick the Great*, or the most recent work on Egyptology or botany. To go with him on a holiday during the summer vacation was a joy given to some of us. In everything Mr. Caird was generous to an extreme degree; many suspected, but only those intimately associated with him in his private work knew, the extent of this. The honour of the service rendered was often insisted on as in itself a sufficient reward. To the wounded officer who had insisted on being treated as a private patient and who wished to recompense him, he said, "I have operated on you; you have fought for me, and I am still your debtor." Mr. Caird died as he had lived, quietly and happily. The cup that was at his lips he carefully replaced; his head sank forward, and he passed peacefully to his maker.

time was he late. Generations of St. Mary's men will remember Lane's nine o'clock lecture as their first introduction to the study of medicine, and many will call to mind the dry sarcasm which rewarded a particularly wild shot at answering the questions which always followed his lecture. The writer, when a student, was his prosector, and well remembers Lane's greeting when he arrived late one Monday morning, "I presume, Mr. X., your late arrival is a mark of contrition for the dissection on which I am to lecture." Lane was editor of the ninth and last edition of Heath's *Practical Anatomy*, which appeared in 1902.

In 1891 he was appointed surgeon to out-patients at St. Mary's. He had already become a member of the staff of the Lock Hospital, and his name rapidly became known as an authority on venereal diseases. It was with this sphere of work that most of his writings dealt, and many of the articles on this subject in "System" or "Index" were from his pen. His distinction in this respect was recognized when the Royal Commission on Venereal Diseases was set up in 1913 and he was made one of its members. His association with the London Lock Hospital lasted in all for forty-seven years, and the following appears on the minutes of the Board of Management, dated December 17th, 1925:

"That this Board having heard the letter addressed to the Chairman from Mr. Ernest Lane, resigning his position as honorary senior surgeon, owing to his prolonged illness, resulting from his serious accident in November, 1923, accept the resignation with deep regret.

"The association of Mr. Lane's family with the Hospital dates back to 1846; his father and great-uncle having held the position of honorary surgeon before him, while Mr. Lane commenced his connexion in 1878, ultimately rising, as they did, to the highest post on the staff.

"The Board, in grateful remembrance of these long family records, desire in particular to place on their Minutes an expression of their deep appreciation of the great services Mr. Lane has rendered."

After an unusually long spell in the out-patient department Lane was appointed surgeon to St. Mary's Hospital in 1904, and continued in office until his retirement in 1922. He was unfailingly generous and unselfish in his dealing with his juniors, who had much for which to thank him in the readiness with which he allowed them full opportunities for work in the beds which were under his charge. At all times he commanded respect by his absolutely straight and well balanced attitude in matters affecting the welfare and internal conduct of the hospital and medical school. His popularity was exemplified by his enthusiastic reception when he was chairman of the annual dinner of past and present students in 1910. He remained to the end devoted to the school which three generations of Lanes have served. In 1914, when war was declared, he was on the staff of the 3rd London General Hospital, and worked with that unit throughout as a major in the R.A.M.C., T.F. He examined in anatomy at the Conjoint Board and for the F.R.C.S., and was for many years a member of the Court of Examiners of the Royal College of Surgeons. He was elected to the council of the College in 1913 and served until 1921. He was one of the honorary secretaries of the Section of Surgery of the Annual Meeting of the British Medical Association in Newcastle-upon-Tyne in 1893. He was a prominent Freemason, and was one of those chiefly instrumental in founding the Sancta Maria Lodge in connexion with his own hospital; for nearly twenty-five years he was its secretary, and to him, in greatest part, the outstanding success of the lodge is due.

Not long after his retirement from active work at St. Mary's he sustained a serious accident, being knocked down by an omnibus in Regent Street. This left him bedridden. For three years he endured his discomforts and disabilities with exemplary patience until he passed away peacefully on November 4th at the Star and Garter Home, at Richmond, where he was cared for by one of his former pupils.

In 1900 he married Miss Gertrude P. Woram, but leaves no family. Our deep sympathy is extended to his widow.

The funeral took place at the Old Fulham Cemetery on November 8th, and was attended by many of his former colleagues, his old pupils, and other personal friends.

SIR CHARLES RYAN, K.B.E., C.B., C.M.G.,

Major-General, Australian Army Medical Service.

Major-General Sir Charles Snodgrass Ryan died on October 24th on the Orient s.s. *Otranto*, which had just reached Adelaide from England. He was born on September 20th, 1853, in Melbourne, the son of Charles Ryan, of Derriwait, Upper Macedon, Australia, and grandson of Henry Ryan, of Kilfera, co. Kilkenny. He was educated at Melbourne Grammar School and at Edinburgh University, where he graduated M.B. and C.M. in 1875; he studied also at Paris, Vienna, and Bonn. He joined the Turkish army as a surgeon in 1876, and served for two years, first in the Turco-Servian and later in the Russo-Turkish war, in 1876-78. He served with the Turks throughout the siege of Plevna, and was the only British officer present in these operations, when Ghazi Osman Pasha put up a magnificent defence of improvised earthworks, formerly unknown, while the regular Turkish forts fell easily before the Russian advance. For his services he received the Turkish Orders of the Medjidie and Osmanli, as well as the Turkish war medal. After returning to Australia he became surgeon, and later consulting surgeon, to the General Hospital and Children's Hospital at Melbourne, a member of the Faculty of Medicine of Melbourne University, medical officer of the Victorian Railway Department, honorary physician to the Governor-General of Australia, and principal medical officer of the Commonwealth Military Forces in Victoria. He also held the post of Consul-General for Turkey in Australia. When the late war began he came to Europe with the Australian Army, as P.M.O., with the rank first of colonel and later of major-general, and served as such at Anzac in Gallipoli peninsula, in France, and in England. He received the C.B. in 1916, the C.M.G. and K.B.E. in 1919, and the Volunteer Decoration. He was the author of a work, *Under the Red Crescent*, in which his war experiences in Turkey were described. In 1883 he married Alice, daughter of the Hon. Theophilus Sumner, M.L.C., of Victoria. She died in 1923, leaving one son, Lieut.-Colonel R. S. Ryan, D.S.O., and one daughter.

CUTHBERT BALFOUR PAUL, F.R.C.S., M.B.,

Ch.B.Edin.,

Surgeon to the Cumberland Infirmary.

We regret to announce the death of Mr. Cuthbert Balfour Paul, who died on October 25th, in his fiftieth year, in a nursing home in Amsterdam, from erysipelas. In company with a party of English surgeons he had been visiting a number of the principal Dutch hospitals.

Mr. Paul was the third son of Sir James Balfour Paul of Edinburgh, for many years Lyon King of Arms, and was educated at Edinburgh Academy and University, where he graduated M.B., Ch.B. in 1900, and obtained the diploma F.R.C.S. in 1903. After holding the posts of resident house-surgeon at the Chalmers Hospital and the Sick Children's Hospital, he became private assistant to Sir Harold Stiles, and worked under him for six years. In 1904 he was appointed assistant surgeon to the Chalmers Hospital, and in March, 1910, assistant surgeon to the Hospital for Sick Children, having entire charge of the surgical out-patient department. In 1912 he was elected assistant honorary surgeon to the Cumberland Infirmary, and soon established a large practice in Carlisle. During the war he performed valuable service at the Cumberland Infirmary, and was visiting surgeon to the Red Cross Hospital at Murrell Hill House. He took an active interest in the progress of the Cumberland Infirmary, and two years ago was appointed one of the honorary surgeons; since there was no vacancy at the time, the statutes had to be amended to enable the committee to pay him this compliment.

Mr. Paul was associated with Sir Harold Stiles in translating into English the fifth German edition of Professor Kocher's standard *Textbook of Operative Surgery*. He was a member of the British Medical Association.

When his wife died, six years ago, it seemed for a time that he would not recover from the loss; but lately much of his old buoyancy of spirits had returned, and he seemed to have many years of useful life before him when the blow suddenly fell, and in a few moments he had passed beyond the veil. Fothergill had a great personality, which impressed itself upon all who came in contact with him, and he will be greatly missed by a large circle of friends.

W. F. S.

EMIL KRAEPELIN,

Formerly Director of the Psychiatric Clinic at Munich.

Professor Emil Kraepelin, whose death was briefly announced last week, was one of the most distinguished psychiatrists of modern times, and his work has been the stimulus for a vast amount of research in the sphere of mental disorder.

Kraepelin was born in 1856 and grew up in Neu-Strelitz in modest circumstances. Under the influence of his elder brother, Carl, well known as a biologist, he acquired early an interest in the natural sciences. At the conclusion of his high-school education he determined to study medicine in order to become a psychiatrist. He commenced his medical studies in Leipzig in 1874, and in 1875 continued them at Würzburg, attending Rinecker's clinic, which was devoted to the study of dermatology and psychiatry. There he gained a prize for an essay on the influence of acute diseases on the origin of mental disorder. After passing his medical examinations he became assistant to Bernard Gudden, succeeding Forel, in the Munich Kreis Asylum and Clinic. Here he wrote his first treatise, which was on the abolition of punitive measures; it attracted considerable attention. Subsequently he went as assistant to Flechsig at the Leipzig Clinic, but left it to work in the Erbschen Policlinic and in Wundt's laboratory. In 1883 Kraepelin returned to Munich, having shortly before published the first edition of his textbook. In 1884 he became head physician in the Leubus Institution, and later director of the Medical Institution and Sanatorium in Dresden. After this he spent four years at Dorpat, attaining the position of professor of psychiatry at the early age of 30 years. His next move was to the University of Heidelberg, where he spent thirteen busy and fruitful years. He was here in a position to study the course and outcome of his cases, and thus to gain experience which enabled him in 1896 to formulate his conception of dementia praecox as a distinct disease entity.

In 1904 he assumed the directorship of the newly established psychiatric clinic at Munich. This clinic soon began to attract the attention of psychiatrists, who flocked from all parts of the world to attend his post-graduate courses of instruction, and also to gain insight into the administration of a mental clinic for uncertified and early cases. Kraepelin gathered around him workers of the highest distinction, and the team work which is so essential in any endeavour to solve the problems of mental disorder thus became possible. He always realized to the full the importance of the association of clinical and pathological work. At Munich he was able to correlate his clinical teaching of dementia paralytica, dementia praecox, and other psychoses with the important pathological discoveries of Nissl and Alzheimer, and also with the neuro-pathological and serological investigations of Spielmeyer and Plaut. Kraepelin's earlier associations with Wundt led him to concern himself with the elaboration of psychological experimental methods and their application to the problems of clinical psychiatry; in this way he obtained fruitful results from investigations into the psychical effects of poisons, alcohol, hypnotics, tea, morphine, etc., and also of the effects of protracted mental and physical activity.

Kraepelin was without question a great clinician, and his name will always be associated with his classification of the biogenetic psychoses. By applying the criteria of course and outcome to a mass of hitherto undifferentiated clinical material, he was able to formulate the two outstanding conceptions of the relatively benign manic-depressive insanity and the relatively malignant dementia praecox group, and in thus producing order out of chaos he gave an impetus to psychiatry to which has been largely due its unquestioned progress in recent years. This is not the place to attempt a summary of the vast amount of work for which Kraepelin was responsible, and perhaps his great textbook of psychiatry affords the most striking evidence of his industry and genius.

In 1922 Kraepelin retired from the management of the Munich Clinic in order to devote his energies to the development of the German Institute of Psychiatric Research founded by him in 1917. The story of its founding reveals the astonishing fact, to use Kraepelin's own words, that a great enterprise, requiring millions of marks, and serving in the first instance purposes of pure science, had been carried into execution, even amid the tumult of war, in little over a twelvemonth. The preparatory work dated back to the pre-war period, but the scheme had to give place to the great task of the day, until, on January 6th, 1916, with the subscription of the first half-million marks, the possibility of its materializing came within reach. In 1917 was held the first public meeting at which the position of the institute with regard to psychiatry could be made plain, and in 1919 five of the seven departments originally projected had begun their work, each under the leadership of a well known man of science. The functions of this institute were outlined in a masterly summary of the problems of psychiatry and of the methods of investigation which were required for their elucidation.* The conception of dementia praecox opened up a new vista to the younger psychiatrists in this country, though the older psychiatrists were less ready to discard the clinical ideas of their generation. Kraepelin was held in the highest esteem in Great Britain, however, and in recognition of his great services to psychiatry he was elected in 1909 an honorary member of the Medico-Psychological Association Several of his works have been translated into English. On the occasion of the commemoration of his seventieth birthday the *Psychiatrisch-Neurologische Wochenschrift* published a number of articles appreciative of Kraepelin's career as one of the outstanding figures in the history of modern psychiatry, and it is a source of satisfaction that in this series one contribution appeared from the pen of the late Sir Frederick Mott, as President of the Royal Medico-Psychological Association, and another from that of Professor G. M. Robertson, who undertook this duty on behalf of the editors of the *Journal of Mental Science*.

By the death of Professor Kraepelin psychiatry has undoubtedly lost a great clinician, teacher, scientist, and administrator.

JAMES ERNEST LANE, F.R.C.S.,

Consulting Surgeon to St. Mary's Hospital and to the London Lock Hospital.

The death of Mr. James Ernest Lane deprives St. Mary's Hospital of the last remaining link with its founders: Samuel Armstrong Lane, his great-uncle, and James R. Lane, his father, were respectively surgeon and surgeon to out-patients to the hospital when its doors were opened in 1851.

Ernest Lane was born on July 24th, 1857, at 1, Grosvenor Place, S.W. He was educated at Lancing College and at Magdalen College School, Oxford. He entered St. Mary's as a student in 1875. He was a keen athlete, and his stalwart figure is familiar to St. Mary's men in the photographs of the hospital Rugby football team of his day. He won many events in the hospital sports, and on one occasion was the winner of the United Hospitals hurdles. He qualified as M.R.C.S.Eng. in 1880, and in the same year was resident medical officer to the hospital. In 1881 he was appointed demonstrator of anatomy, and this post he held until, in 1888, he succeeded Edmund Owen as lecturer. In 1882 he had obtained the F.R.C.S.Eng. diploma. For seventeen years he lectured for four days a week at nine o'clock throughout the winter, and never once during that

* Reference should be made to an article, Ends and Means of Psychiatric Research, in the *Journal of Mental Science*, April, 1922.

SIR HUMPHRY ROLLESTON, Bt., Regius Professor of Physic, University of Cambridge, has been elected as the representative of the University on the General Medical Council for five years, in place of Dr. W. L. H. Duckworth, resigned. Sir Humphry Rolleston has been the representative of the Royal College of Physicians of London upon the Council since November, 1922.

AT the recent Clinical Congress in Montreal of the American College of Surgeons honorary fellowships were conferred on Professor Robert Alessandria of Rome, Professor Archibald Young of Glasgow, Sir Ewen Maclean of Cardiff, Professor L. E. Barnett of Dunedin, New Zealand, and Professors John Fraser and David Wilkie of Edinburgh.

THE Board of Trade gives notice that representations have been made to it under Section 10 (5) of the Finance Act, 1926, regarding the following articles: Amidopyrin, barbitone, cocaine, cocaine hydrochloride, guaiacol carbonate, hydroquinone, methyl sulphonal, oxalic acid, phenacetin, phenazone, piperazine, salol, sulphonal. Section 10 (5) of the Finance Act, 1926, is as follows: "The Treasury may by order exempt from the duty imposed by Section 1 of the Safeguarding of Industries Act, 1921, as amended by this Act, for such period as may be specified in the order, any article in respect of which the Board of Trade are satisfied on a representation made by a consumer of that article that the article is not made in any part of His Majesty's Dominions in quantities which are substantial having regard to the consumption of that article for the time being in the United Kingdom, and that there is no reasonable probability that the article will within a reasonable period be made in His Majesty's Dominions in such substantial quantities." Any person desiring to communicate with the Board of Trade with respect to the above-mentioned applications should do so by letter addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, S.W.1, within two months from the date of this notice (October 27th).

THE British Social Hygiene Council (Carteret House, S.W.1) has published in one volume the proceedings of the Imperial Social Hygiene Congress, which was held at the British Empire Exhibition at Wembley in October, 1925. Opening addresses were given by the Right Hon. L. S. Amery, M.P., and by representatives of some of the Dominions. Discussion followed on venereal disease in the navy, army, India, the mercantile marine, the self-governing Dominions, and the Colonies and Protectorates. A paper by Dr. Kathleen Vaughan contained some lurid evidence on the organization of prostitution in Kashmir; and a good deal of discussion took place on the need of protection for sailors in seaport towns. The report of the proceedings furnishes a large amount of information for those interested in venereal disease.

THE International Labour Office has issued six further pamphlets, Nos. 46–51, dealing with acid burns, air of work rooms, dangers arising out of working in alabaster and alcoholic intoxication, anguillulosis, diseases due to the preparation of ethyl alcohol, and injuries by fluorine and hydrofluoric acid. When the series of pamphlets is complete, they will be published by the International Labour Office in a bound volume.

THE St. Andrew's Ambulance Association in Scotland has found its headquarters too small. An appeal made early this year for £30,000 to cover the cost of new premises has already brought in about half that amount. The main feature of the association's work is its motor ambulance service for the transport of cases of accident and illness. During the last year 27,410 calls were made upon the ambulance waggons, and of these cases 13,677 were conveyed in the Glasgow area alone. The patients conveyed to hospitals and other places since the formation of the association number 391,969.

THE first number of the students' journal of the Welsh National Medical School, entitled *The Leech*, contains articles on the importance of anatomy by Professor David Hepburn, on thyrotoxicosis by Mr. Lambert Rogers, on biochemistry and modern medicine by Mr. J. Pryde, lecturer in chemical physiology, and articles of clinical and general interest. An appeal is inserted on behalf of the Cardiff Royal Infirmary, the financial position of which has been seriously affected by the coal dispute.

THE November issue of *The Prescriber* is devoted to rheumatic diseases, with special reference to the economic aspect. The subjects treated include fibrositis, osteo-arthritis, rheumatic heart disease, the relation of goitre to rheumatism, the treatment of chronic rheumatic diseases, and spa treatment. The journal may be obtained from the editorial publishing offices, 6, South Charlotte Street, Edinburgh, price 3s. 6d., post free.

Letters, Notes, and Answers.

All communications in regard to editorial business should be addressed to ***The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.***

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the BRITISH MEDICAL JOURNAL alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the BRITISH MEDICAL JOURNAL must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the JOURNAL, should be addressed to the Financial Secretary and Business Manager.

The ***TELEPHONE NUMBERS*** of the British Medical Association and the BRITISH MEDICAL JOURNAL are *MUSEUM 9861, 9862, 9863,* and *9864* (internal exchange, four lines).

The ***TELEGRAPHIC ADDRESSES*** are:

EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Mediocera Westcent, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 4737 Dublin), and of the Scottish Office, 6, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 4361 Central).

QUERIES AND ANSWERS.

"MEDICAL MAYOR" asks for advice in the treatment of a girl, aged 3 years, infested with *Taenia solium*.

BEDS FOR PAYING PATIENTS IN SMALL HOSPITALS.

DR. C. R. DYKES (Buckhurst Hill, Essex) asks for information with regard to country hospitals, with from thirty to fifty beds, providing accommodation for some private patients.

WARTS AND EGGS.

WE have received the following replies to Dr. Leonard Williams's question in the JOURNAL of October 22nd (p. 763). Dr. J. M. MACPHAIL (Middlesbrough) writes: It was a common belief in West Argyllshire that warts could be caused by washing the hands in the water already used for the boiling of eggs, and in many parts of the East of Scotland and in Yorkshire they refuse such water to wash dishes or use in any way.

DR. A. MACMANUS (Rusholme, Manchester) writes: The belief in the association of warts with freshly boiled eggs is fairly common. Some persons will not touch the shell of a warm egg, but use a napkin when transferring it to an egg cup.

THE PLACENTA AFTER PITUITARY EXTRACT.

"R. E." wishes to raise the question with which the following note concludes: After a prolonged second stage in a primipara, aged 27 years, 1 c.cm. of pituitary extract was given and delivery by forceps was then immediately effected. The third stage lasted three and a half hours, presumably owing to the uterus going into tonic contraction. The puerperium was normal. Should the placenta have been manually removed after an hour, according to most orthodox teaching?

CHILBLAINS.

DR. ERNEST A. MILNER (Kington, Herefordshire) writes: If "C.P.J." will give calcium chloride 10 grains thrice a day instead of the lactate—which is an unreliable salt—and parathyroid 1/4 grain once or twice daily, I think he will find the chilblains can be kept at bay.

DR. H. V. CANTOR writes: It may be advisable to try a method advocated by Leonard Mitchell in the *Medical Journal of Australia*, October 2nd, p. 449, which should be consulted for details; the treatment may be summarized thus: The hands may be treated by firmly fitting rubber gloves worn at night; the toes by a cuff of a rubber glove worn around the foot or by a thin piece of sponge rubber held in place by a piece of sticking plaster. The pressure must be firm.

DR. NORMAN HODGSON (Newcastle-on-Tyne) states that he has had good results in the treatment of chilblains from the following mixture, to be taken for three days during frosty weather: Calc. carb. 66 grains, acid. lact. conc. (sp. gr. 1.21) 144 min., aq. menth. pip. ad 12 oz.; 1 oz. thrice daily.

DR. MARY G. CARDWELL (Oldham) writes to suggest the following regime: The patient, sitting in a warm room, has two bowls, one of hot water, the other of cold, into which the hands or feet, as the case may be, are plunged alternately, care being taken to finish up with hot water. The part is then rubbed with a warm rough towel and afterwards with olive oil. This should be done twice daily and should be begun in early autumn. "Success depends on the conscientious carrying out of the treatment combined with vigorous friction. Cod-liver oil and malt is a useful adjunct."

Dr. Joseph Cantley, who died suddenly on October 23rd, at his residence in Manchester, received his medical education at Trinity College, Dublin. He obtained the L.R.C.P., L.R.C.S.Ed., the L.R.F.P.S.Glasg., and L.M. in 1890, and the L.M. of the Rotunda Hospital, Dublin. Dr. Cantley had practised at Higher Crumpsall, Manchester, for more than thirty years, and was a well known figure at medical meetings, where his independent outlook was always much appreciated. He had been a member of the Lancashire and Cheshire Branch Council of the British Medical Association since 1915, and was chairman in that year. Since 1919 he had been vice-chairman of the Branch, and also a member of the Representative Body. He leaves a widow and four children.

Dr. Constance Muriel Marrat (*née* Willis), who died of pneumonia at Woking on October 10th, in her thirtieth year, received her medical education at the London (Royal Free Hospital) School of Medicine for Women and St. Mary's Hospital. In 1921 she graduated M.B., B.S.Lond., and obtained the diplomas M.R.C.S., L.R.C.P. She held the posts of obstetric officer and resident anaesthetist successively at St. Mary's Hospital. Her career was then interrupted by a long illness, but in 1924 she became assistant resident medical officer at Nayland Sanatorium for six months, and subsequently at Dagenham Sanatorium for more than a year. In 1925 she married, and shortly after was appointed deputy assistant medical officer of health at Woking, where her sympathy and skill with the mothers and children quickly increased the attendance at the clinics. She was a member of the British Medical Association. A colleague writes: Dr. Marrat had a wide circle of friends, who will miss her ever-ready interest and sympathy on all matters, small and great. She was keen, neat, and methodical; had she lived she would undoubtedly have built up a good general practice in Woking.

Medical News.

The next session of the General Medical Council will commence on Tuesday, November 23rd; the President, Sir Donald MacAlister, Bt., K.C.B., M.D., will take the chair at 2 p.m. and give an address. The Council will continue to sit from day to day until the termination of its business.

The annual dinner of the Medico-Legal Society will be held at the Holborn Restaurant, London, on Friday, December 10th, at 7.15 o'clock, with the President, Lord Justice Atkin, in the chair. At the meeting of the society to be held at 11, Chandos Street, Cavendish Square, W., on Thursday, December 2nd, at 8.30 p.m., a communication will be made by Professor Harvey Littlejohn and Dr. Douglas Kerr on "Monoxide poisoning—its increasing medico-legal importance." Discussion will follow.

The Glasgow University Club, London, will dine at the Trocadero Restaurant, Piccadilly, on Friday, December 3rd, at 7.30 precisely. The Lord Rector, the Right Hon. Sir Austen Chamberlain, K.G., will preside, and the Lord Chief Justice will be one of the guests. Any Glasgow University men who, though not members of the club, desire to attend are requested to write to the Honorary Secretaries, 62, Harley House, N.W.1.

The half-yearly dinner of the Aberdeen University Club, London, will be held at Kettner's Restaurant, 29, Church Street, W.1, on Thursday, November 25th. There will be a reception at 7 p.m., and Professor William Bulloch will take the chair at 7.30 p.m. The price of the dinner, exclusive of wine, will be 10s., and Dr. W. A. Milligan (11, Upper Brook Street, W.1) will be glad to hear from any graduate (lady or gentleman) wishing to attend. Guests may be invited.

At the meeting of the Post-Graduate Hostel to be held at the Imperial Hotel, Russell Square, W.C.1, on Tuesday, November 16th, Professor C. A. Pannett, F.R.C.S., will lecture on the treatment of gastric and duodenal ulcers, and on Friday, November 19th, Dr. Maule Hall will speak on the practitioner and the public health man. The meetings commence at 9 p.m.; dinner is served at 8 p.m. (price 5s.), and coffee and biscuits at 10 p.m. (price 6d.)

Mr. V. Z. Cope will lecture for the Fellowship of Medicine on acute intestinal obstruction at the house of the Medical Society of London, 11, Chandos Street, W., on November 18th, at 5 p.m. On November 19th, at 1 p.m., Mr. Charles Goulden will give a clinical demonstration in ophthalmology at the Royal London Ophthalmic Hospital, and on the same day, at 2 p.m., Mr. Clifford Morson will give a demonstration in surgery at St. Peter's Hospital. The lecture and the two demonstrations are open to members of the medical profession without fee. From November 15th to December 4th the Royal Waterloo Hospital will hold a course in medicine, surgery, and gynaecology, with special reference to endocrine deficiency, diseases of the blood, thyroid, respiratory diseases, cardiac affections, and rheumatism. St. John's Hospital will hold a four weeks' course in dermatology, commencing on November 15th; there will be clinical instruction and two lectures a week; for those desirous of studying the pathology a series of practical demonstrations will be arranged. At St. Mark's Hospital there will be a comprehensive course in diseases of the rectum from November 22nd for one week. Starting on November 22nd and continuing for four weeks there will be a late afternoon course in neurology at the West End Hospital, 73, Welbeck Street. The London Temperance Hospital will undertake a general practitioners' course (4.30 to 6 p.m.) from November 29th to December 11th. Courses in obstetrics can be provided at Queen Charlotte's Hospital and the City of London Maternity Hospital; practical courses in anaesthetics can also be arranged; and personal applications may be made to the Fellowship of Medicine for clinical assistantships at the Samaritan Hospital for Women. Copies of all syllabuses and of the general course programme may be obtained from the Secretary of the Fellowship, 1, Wimpole Street, W.1.

Dr. A. Brown Kelly of Glasgow will deliver the Semon Lecture in the Robert Barnes Hall, 1, Wimpole Street, London, on Thursday, December 2nd, at 5 p.m. His subject is "Nervous affections of the oesophagus."

The Geoffrey E. Duveen lectures in otology will be given this year by Mr. Richard Lake, F.R.C.S., at University College Hospital Medical School. The first lecture (on the mastoid operation) will be delivered on Tuesday, November 23rd, and the second (on otitic intracranial abscesses) on Tuesday, December 7th. The lectures, which are open to all qualified practitioners and to medical students, will be given at 5 p.m. on each day.

The following members of the medical profession are among the mayors elected in England and Wales on November 9th: Dr. E. Collingwood Andrews (Hampstead), Dr. H. J. Campbell (Dartmouth) re-elected, Dr. Douglas E. Finlay (Gloucester), Dr. W. E. St. L. Finny (Kingston), Sir Thomas E. Flitcroft (Bolton), Dr. J. R. Leeson (Twickenham), D. H. Malins (Warwick), Dr. J. H. Nixon (Chippenham), Dr. R. S. Pearson (Lambeth), Mr. Ransom Pickard (Exeter).

Dr. David Shannon, J.P., lecturer in clinical obstetrics in the University of Glasgow, has been appointed a deputy lieutenant of the county of the city of Glasgow.

Dr. Charles James Marsh, who was honorary surgeon to the Yeovil Hospital from 1880 to 1926, since when he has served it as honorary secretary and treasurer, was honoured on November 3rd by the unveiling in the hospital of a bronze bust of himself. Dr. Marsh was a member of the executive committee of the West Dorset Division of the British Medical Association from 1908 to 1916 and again from 1919 to 1922. He was a member of the Dorset and West Hants Branch Council in 1908 and from 1917 to 1919, and president of the Branch in 1910. He has been a member of the Representative Body since 1923.

A memorial to Sir Richard Douglas Powell, Bt., M.D., a former President of the Royal College of Physicians of London and physician in ordinary to the King, was dedicated recently by the Bishop of Buckingham at Cheddington Parish Church. The memorial has been given by Lady Powell; it consists of a silver cross and altar candlesticks.

A stained glass window, erected in the chapel of the Holloway Sanatorium, Virginia Water, to the memory of the late Dr. W. D. Moore, for twenty-seven years medical superintendent of the institution, was unveiled by Sir Lindsay Smith, chairman of the Board of Management, on October 30th. The dedication service was performed by the Bishop of Guildford.

A bronze bas-relief in honour of the late Professor Weill, the eminent pediatrist, has recently been unveiled at the Hôpital de la Charité, Lyons, when speeches were delivered by the ex-Premier, M. Herriot, and Weill's successor, Professor Mouriquand.

On All Souls' Day (November 2nd) His Highness Maharaja Sir Chandra Shumsher Jung of Nepal had a wreath placed on the grave of Dr. A. C. Inman in Père la Chaise Cemetery, Paris, "in grateful recollection of skilful help and faithful friendship." Dr. Inman was pathologist to Brompton Hospital, and died last July.

The French Ambassador in London has informed His Majesty's Government that the centenary of Laënnec will be celebrated in Paris on December 13th, 14th, and 15th next, and that Professor Chauffard, of the Academy of Medicine in Paris, is in charge of the arrangements.